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THE TRANSACTIONS OF THE LINNEAN SOCIETY OF LONDON.

VOLUME XVII.

LONDON:

PRINTED BY RICHARD AND JOHN E. TAYLOR, RED LION COURT, FLEET STREET:

SOLD AT THE SOCIETY'S HOUSE, SOHO-SQUARE;

AND BY LONGMAN, REES, ORME, BROWN, GREEN, AND LONGMAN, PATERNOSTER-ROW;

AND WILLIAM WOOD, TAVISTOCK-STREET, COVENT-GARDEN.

MDCCCXXXVII.

MISSOURI
BOTANICAL
GARDEN.

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PART THE FIRST.

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TRANSACTIONS

OF

THE LINNEAN SOCIETY.

I. *Description of the Organ of Voice in a new Species of Wild Swan* (Cygnus Buccinator, *Richardson*). *By* William Yarrell, *Esq., F.L.S. & Z.S.*

Read March 20th, 1832.

I AM indebted to the liberality and kindness of Dr. Richardson for an example of the sternum and trachea of a new species of wild swan, the *Cygnus Buccinator* of the *Fauna Boreali-Americana,* Part II., of Mr. Swainson and Dr. Richardson; a work in ornithology unexampled for beauty of illustration and accuracy of detail.

The possession of this valuable and probably unique specimen affords me an opportunity of placing before the members of the Linnean Society the following description and drawing.

The interesting variations which will be observed in the organ of voice in this newly discovered species, as compared with the same parts in other known swans, is an additional proof of the value of internal evidence as decisive of specific distinction; and it is particularly worthy of notice, that as the shape and colour of the beak; the number of the tail-feathers; the course of the tube of the trachea within the cavity of the sternum; and the form of the bronchiæ;—from the modifications observed in them all;—have been considered satisfactory as establishing the claim of *Cygnus Bewickii* to rank as a species distinct from the Hooper: the same parts, external as well as

internal, in *Cygnus Buccinator,* will be found to be all equally distinct from both.

Cygnus Buccinator is the most common swan in the interior of the fur-countries of North America; and it is to this species, which is called the Trumpeter, that the largest portion of the swan-skins imported by the Hudson's Bay Company belong.

These swans probably require five or six years to arrive at their full size; but this point attained, they are considerably larger than the oldest Hooper.

The beak of the Trumpeter is entirely black, without any of the yellow-orange colour so conspicuous in the Hooper and Bewick's swan; and, being at the same time larger, longer, and more depressed, at once distinguishes this new species.

The forehead alone is tinged with rust-colour, and this tint prevails over a larger space in younger specimens; the rest of the plumage is pure white: the third quill-feather of the wing is the longest; the tail-feathers 24 in number; the legs black.

The trachea is made up of narrow bony rings and small intervening membranous spaces as far as the first convolution within the breast-bone, but the returning portion of the tube, forming a second convolution, is composed of broader and stronger bony rings with wider intervals. In these peculiarities of structure it resembles the trachea of the Hooper; but in its course within the sternum, as also in the form of the bronchiæ, it is decidedly different.

The trachea, after descending by the neck, passes backwards within the keel and between the two plates of the breast-bone to the depth of six inches, then curving horizontally and slightly inclining upwards, returns, at first by the side of, and afterwards over, the first inserted portion, near two thirds of the whole distance. A second curve of this returning portion is then suddenly elevated two inches above the line of the superior surface of the keel, and traverses the interior of a hollow circular protuberance on the dorsal surface of the sternum itself. The usual ascending curve of the trachea then ensues, by which the tube, ultimately receding, gains the internal cavity of the breast. The bone of divarication is placed over the centre of the protuberance before mentioned. The bronchiæ are but two inches each in length, small at their

origin and at their junction with the lungs, but greatly expanded throughout the intermediate portions, and somewhat depressed, being one inch one line wide, and only eight lines in depth.

The muscles of voice are the same in number and situation as in the Hooper and *Cygnus Bewickii.*

The whole length of the sternum is nine inches three lines, the greatest width four inches; the hollow protuberance on its internal surface is formed by a sudden rounded elevation of the superior bony plate, which is compressed at the sides, and measures in length as also in height one inch six lines, and in width nine lines; from the edge of the keel to the upper surface of the protuberance three inches five lines.

The following other measurements are here inserted for comparison with those of our British wild swans in the last-published Part of the Transactions of this Society.

	Inches.	Lines.
Point of beak to the end of the tail	70	0
——— edge of the forehead . . .	4	11
——— eye	6	0
——— occiput	8	0
Carpus to the end of the primaries	24	0
Tail-feathers, in number, 24.		
Length of tarsus	4	6
——— middle toe and nail	6	9
——— the breast-bone	9	3
Depth of insertion of the trachea	6	0
Length of the bronchial tubes	2	0

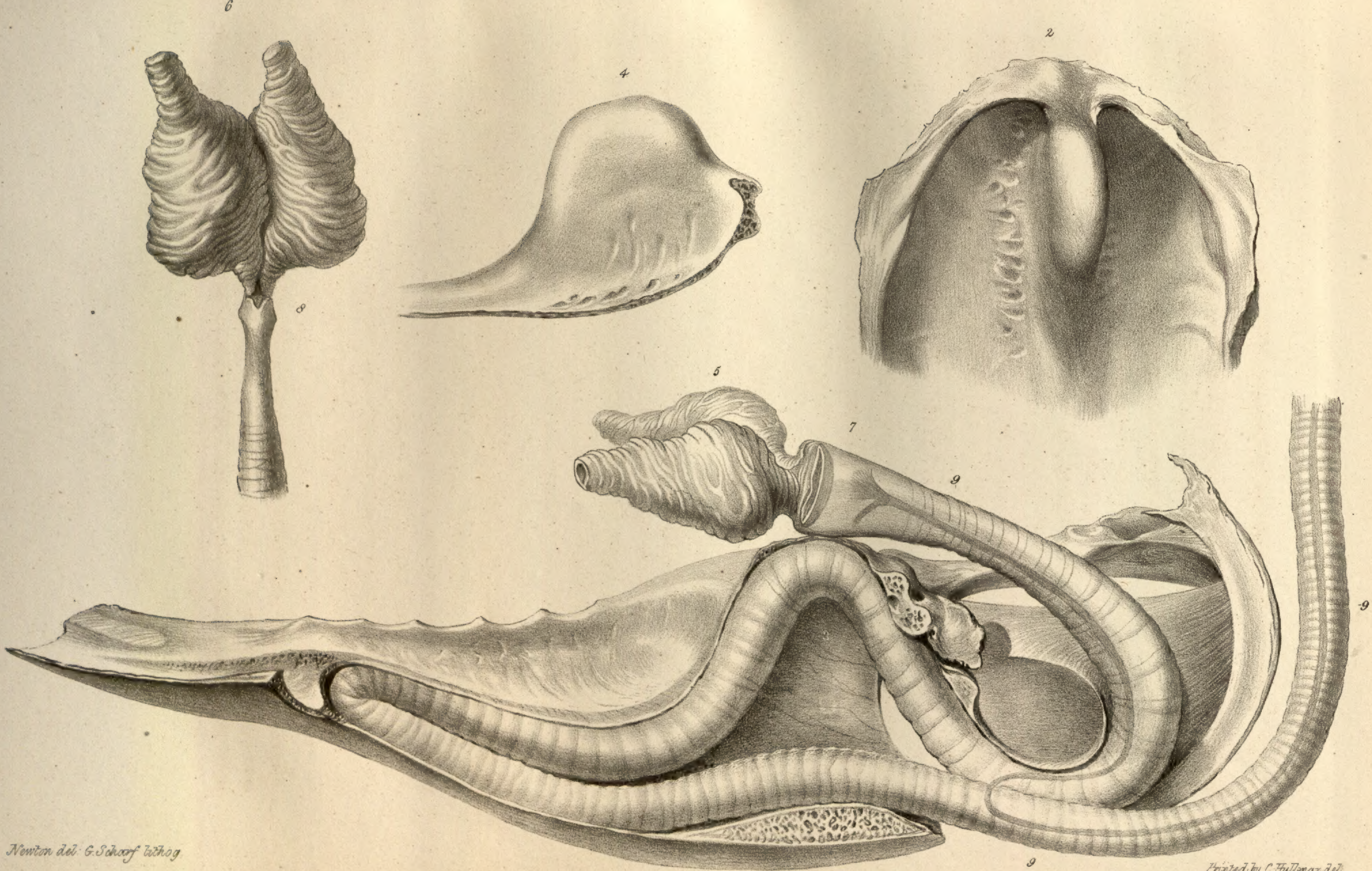
A fine preserved specimen of the Trumpeter in the museum of the Hudson's Bay Company, in Fenchurch Street, afforded the external measurements here detailed. Two skins of swans of the same species in the collection of the Zoological Society are from younger birds, and are somewhat smaller in their several dimensions.

The Hooper, it will be recollected, has but one decided convolution of the trachea within the sternum, and that one is vertical; Bewick's swan has also but one convolution, and that horizontal; our present subject, it will be seen,

has two convolutions within the sternum, of very opposite character in their directions; the bronchiæ also differ materially from both. The representations of the various parts, on comparison with those already published, will render these differences much more apparent than this concise description; and the examination of them will, I trust, convince ornithologists that the *Cygnus Buccinator* of Dr. Richardson is a species perfectly distinct from any hitherto made known.

EXPLANATION OF TAB. I.

Fig. 1. Side view of the sternum, a section having been made to show the trachea in its natural situation.
2. The anterior portion of the sternum, seen from above.
3. The inside of the hollow protuberance.
4. The protuberance, seen from the right side.
5. The bronchiæ, seen from the side.
6. The bronchiæ, seen from above.
7. The bone of divarication, side view.
8. The same bone, seen from above.
9. The muscle of voice in its course along the tube of the trachea.



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Sternum and Trachea of Cygnus Buccinator, ⅓ less than the Nat. Size.

II. *Descriptions of three British Species of fresh-water Fishes belonging to the Genus* Leuciscus *of Klein. By* WILLIAM YARRELL, *Esq. F.L.S. & Z.S.*

Read June 19th, 1832.

PENNANT in his published account of a Tour in Scotland and Voyage to the Hebrides, pp. 11. and 12, has the following observation.—"In the Mersey near Warrington, and in the river Alt, which runs by Sephton, Lancashire, into the Mersey near Formby, a fish called the Graining is taken, which in some respects resembles the Dace, yet it is a distinct and perhaps new species."

A short description of this fish, occupying a few lines only, appears in the quarto edition as well as in both octavo editions of the British Zoology; and the Graining is also characterized by Shaw in the 5th volume of his General Zoology, page 234, as follows:

"*Cyprinus Lancastriensis.* Pennant's Graining.

"C. argenteus, dorso subrecto cœrulescente, oculis pinnisque inferioribus rubentibus."

Notwithstanding these notices, this fish remains comparatively unknown to the present time, and has not, that I am aware, been found in any other locality.

One of the streams which produce the Graining rises in Knowsley Park; and I have, by the kindness of Lord Stanley, the President of this Society, been most liberally supplied with specimens of this fish, from the examination of which the following particulars have been derived.

The Graining, though similar to the Dace in shape, is yet distinguished from it by being still more slender in its form. In the Dace the length of the fish is in proportion to the depth as 4 to 1: in the Graining these proportions are as 5 to 1; and there are also other differences to be hereafter noticed.

The Graining has the top of the head, the back, and upper part of the sides of a pale drab-colour tinged with blueish red, and separated from the lighter-

coloured and inferior parts by a well-defined boundary line; the irides are yellowish white; infra-orbital portion of the head, the operculum, and sides, shining silvery white tinged with yellow; all the fins pale yellowish white; the lateral line descending from the upper angle of the operculum by a gentle curve to the middle of the body, thence to the centre of the tail in a straight line; the scales of moderate size, marked with numerous concentric striæ, and prominent radiating elevated ridges, the central portion of each scale being brighter than its sides, and producing the appearance of shining longitudinal lines extending the whole length of the body. The head is small, depressed; the cheeks flat; the line of the back but little elevated; the dorsal fin commences exactly half-way between the nose and the end of the fleshy portion of the tail; the first dorsal fin-ray is short, the second ray the longest, the last ray double. The mouth is small, without teeth on either of the maxillary bones; the eye large; nostrils pierced nearer the eye than the nose; branchiostegous rays 3, operculum of two pieces. The pectoral fin arises below a triangular plate directed backwards; the abdominal line moderately convex; the ventral fins are placed on a vertical line, but little in advance of the anterior portion of the dorsal fin; the anal fin commences, on a vertical line, immediately under the termination of the dorsal fin-rays, when that fin is depressed; the first ray of the anal fin is short, the second ray the longest, the last ray double; the fleshy portion of the tail is long and slender, its rays deeply forked. I can speak with confidence to the differential characters of the Graining and Dace, having been favoured on this occasion with a Dace from the same stream which produced the Graining. The length of the Dace compared to the depth is, as I have stated, but as 4 to 1; the back and sides are yellowish olive strongly tinged with blue, passing by imperceptible gradations to silvery white beneath; the lower fins are pale red; the pectoral fin not surmounted by a similar triangular plate; and the radiating lines on each scale are produced by grooved depressions and not by elevated ridges. The number of all the fin-rays is different, those in some of the fins being greater, and in others less.

	D.	P.	V.	A.	C.
Graining	9.	17.	10.	11.	19.
Dace	12.	15.	9.	12.	19.

Several streams in the townships of Burton Wood and Sankey, which flow into the Mersey below Warrington, and others in or near the township of Knowsley, which also form the Alt, produce the Graining in considerable numbers. In its habits and food it resembles the Trout, frequenting both the rapid and still parts of the rivers, but is not known to exist in ponds. It is fished for with artificial flies like the Dace or Trout; and Mr. Bainbridge, an enthusiastic fisherman, in his excellent Fly-fisher's Guide, published at Liverpool, says, "that as they rise freely, they afford good sport to the angler, and when in the humour, it is not difficult to fill a pannier with them. They sometimes, though not commonly, exceed half a pound in weight, and are much better eating than the Dace."

The largest specimen sent up to me on the present occasion measured nine inches in length.

A short description of the Graining in Mr. Bainbridge's work is thus given. "Rather more slender than the Dace; the body almost straight; colour of the scales silvery, with a blueish cast; the eyes, the ventral and the anal fins, are of a pale colour."

Following the systematic arrangement of Baron Cuvier in the 2nd volume of the *Règne Animal,* this species will now range under the first division of the genus *Leuciscus* of Klein, distinguished by the position of the dorsal fin, which is placed in a vertical line immediately over the ventral, and of which division our well-known Roach and Dace are examples.

As the specific character of the Graining given by Dr. Shaw does not precisely agree with that fish as described by Mr. Bainbridge and myself, I propose to substitute the following, but still retaining the trivial name applied to the species by that naturalist.

Leuciscus Lancastriensis. Pennant's Graining.

L. elongatus, pinnâ dorsali supra pinnas ventrales positâ, caudali profundè bilobâ, capitis lateribus suprà subparallelis; ore parvo; dorso lateribusque supernè subrufescenti-isabellinis, infernè ventreque argenteis.

With specimens of the Graining, for which I acknowledge my great obligations to Lord Stanley, another species of the same genus was sent, which is also new to our British catalogue, and which, like the Graining, is not de-

scribed, as far as I have been able to ascertain, in any of the different works of European ichthyologists.

From the prevailing blue colour of this fish, I have been induced to call it the Azurine, *Leuciscus cœruleus*. It belongs to Cuvier's second division of the genus *Leuciscus* of Klein, a division intended to include those species in which the dorsal fin is placed, in a vertical line, over the space between the ventral and anal fins, and of which division our Red-eye, Bleak, and Minnow, are examples. The specific characters of the Azurine may be stated as follows:

L. ovato-lanceolatus, pinnâ dorsali pone pinnas ventrales positâ; dorso plumbeo, ventre argenteo, pinnis albis.

B. 3. D. 10. P. 16. V. 9. A. 12. C. 19.

The depth of this fish is to its length as 7 to 2, and it is therefore in shape very similar to our Red-eye; but is at once distinguished from that species by the silvery whiteness of the abdomen, which in the Red-eye is of a brilliant golden orange; and also by its white fins, which in the other are invariably of a fine vermillion. It also differs in the number of its fin-rays.

The Azurine has the upper part of the head, back and sides of slate blue, passing into silvery white beneath, and both shining with metallic lustre; the irides white, tinged with pale straw yellow; all the fins white; the lateral line, descending rapidly from the upper edge of the operculum, takes a curve parallel to the deep convex line of the abdomen; the scales large, marked with a variable number of radiating lines; the head small, depressed, and broad; the back arched; the dorsal fin commences half-way between the posterior edge of the eye and the end of the scaly portion of the tail; the first dorsal fin-ray is short, the second ray the longest, the last ray double. The muzzle is blunt; the mouth small, and without teeth; the eye large; nostrils pierced on the upper surface of the nose, midway between the eye and the upper lip; operculum of two portions, the upper one large and marked with radiating lines. The abdomen convex; the pectoral fins long, reaching nearly to the origin of the ventral fins, which arise, on a vertical line, considerably in advance of the dorsal fin, and thus bring that fin over the interval between the ventral and anal fins. From the vent the body diminishes rapidly, and the

anal fin is situated on the obliquity thus produced. The first ray of the anal fin is short, the second the longest, the last ray double. The fleshy part of the tail is narrow, the rays moderately forked, the central rays being only half as long as those which are terminal.

The localities from which this species is derived, within the township of Knowsley, are but limited. It is hardy, tenacious of life, and spawns in May. The flesh is said to be firm, of good flavour, and to resemble that of the Perch. The food, and the baits used for its capture, are the same as those taken by the Carp; and the largest specimen known was not supposed to exceed one pound in weight. I hope at some future period to be able to add further details.

While fishing in the month of August last in the Thames below Woolwich, with the mouth of a whitebait net open against a strong flood-tide, I caught a single specimen of *Cyprinus Dobula* of Linnæus, but have not been fortunate enough to obtain any more since. This species, well described and figured by Bloch, No. 5, is common to the Elbe, the Weser, and other rivers on the opposite coast, but has not, that I am aware, been recorded before as having been taken in any river of England. This fish also belongs to the genus *Leuciscus* of Klein, and to the same division of that genus as the Graining, *Leuciscus Lancastriensis*.

The specimen taken was 6½ inches long, and being a young male fish, was slender in proportion to its length. The general colour a dusky blue on the back, becoming brighter on the sides, and passing into silvery white beneath. The lateral line, descending from the upper angle of the operculum, takes a course along the side parallel to the curve of the belly; scales of moderate size; dorsal and caudal fins dusky brown; pectoral, ventral and anal fins pale orange red; head rounded and blunt; upper jaw the longest, the under jaw shutting within it; nostrils pierced on the upper side of the head, rather nearer the eye than the upper lip; irides orange; cheeks and operculum silvery white; first ray of the dorsal fin arising half-way between the anterior edge of the orbit of the eye and the end of the fleshy portion of the tail, the first ray short, the second the longest, the last ray double; of the anal fin also, the first ray is short, and the last ray double. Bloch says, this fish prefers clear rivers and large lakes, in which it deposits its spawn in the months of March and

April. It is said to feed on worms, small white snails, and water-insects. In its appearance this fish somewhat resembles our Roach, but is much less deep for its length, and darker in colour; it seldom exceeds half a pound in weight, and is not in much esteem as an article of food. Like most of those fishes that swim near the surface, the specimen herein referred to died very soon after being taken out of the water. The numbers of fin-rays were as follows:

D. 9. P. 16. V. 9. A. 10. C. 20.

1

2

1. The Graining. 2. The Azurine.

Zeitter, sc.

III. *Observations on the* Tropæolum pentaphyllum *of Lamarck. By Mr.* David Don, *Libr. L.S.*

Read December 18th, 1832.

THIS curious plant is a native of the regions bordering on the Rio de la Plata, where it appears to be far from rare, as it occurs in most of the collections that we have seen from those countries. It was first discovered by Commerson; and from the materials collected by that indefatigable naturalist, Lamarck was enabled to give a figure and description of the species in the botanical part of the *Encyclopédie Méthodique,* under the appellation of *Tropæolum pentaphyllum,*—a name, it will be admitted, misapplied to a plant whose leaf is merely deeply lobed. Another figure and description of the same plant, but under a different, although no less objectionable name, occurs in an academical dissertation on this genus, by Professor Hellenius, and published at Abo in 1789, a short time after those by Lamarck had appeared. M. Auguste de Saint-Hilaire has likewise given a figure and description of it in his *Plantes Usuelles des Brasiliens.* Notwithstanding these several authorities, the characters of the plant have been hitherto but partially understood; and it was not until its recent introduction to the British gardens that the peculiarities of its structure have been ascertained. In the month of August last, while on a visit at Edinburgh to my much-esteemed friend Mr. Neill, to whom we are indebted for its introduction, I had the pleasure of seeing this interesting plant in flower, and subsequently with ripe fruit, which has enabled me to determine its claims to be regarded as the type of a new genus. The most remarkable peculiarity is in the nature of its fruit, which is a black, juicy berry, not unlike, both in appearance and flavour, the Zante grape. Besides the reduced number of its petals, a character the importance of which I am not disposed to insist much upon, the genus likewise differs in the valvate æstivation of its calyx, (a distinction first pointed out by M. Auguste de Saint-Hilaire,) that of *Tropæolum* being imbricate. Neither of these characters has

been noticed in the figures and descriptions of the plant which have recently appeared in the Botanical Magazine and Register. I am inclined to think that *Tropæolum dipetalum* of the *Flora Peruviana* will prove to be a second species of this genus, and it is possible that *Tropæolum* may include the types of other genera, when the nature of the fruit in the different species becomes better known.

The genus *Tropæolum* was originally included by Jussieu among his *Gerania;* but he afterwards changed his opinion somewhat, in considering it the type of a distinct group; still adhering, however, to his former views of its affinity, by continuing to place it next that family, in which he has been followed by Richard, DeCandolle, Auguste de Saint-Hilaire, and other botanists of deserved eminence. The *Tropæoleæ* differ in many important points of structure from the *Geraniaceæ*, particularly in the want of symmetry between the stamina and other parts of the flower; in the structure of their stigmata; in their thick, fleshy cotyledons, with the short radicle placed between their lobes; in the conspicuous plumule, by their axillary flowers; and finally in the absence of stipules. They have always appeared to me to be more nearly related to the *Capparideæ* than to any other family, being principally distinguished from them by the quinary arrangement of the petals and lobes of the calyx. In the hypogynous insertion and indefinite number of the stamina, in the inequality of the petals, pendulous ovula, thick, fleshy cotyledons, absence of albumen and stipules, and in the axillary inflorescence, both families agree precisely. In the *Tropæoleæ* there is likewise an evident indication of the pistilliferous column so conspicuous in *Capparideæ.* On comparing this family with the *Hippocastaneæ* many striking analogies present themselves; such, for example, as the quinary arrangement of the petals and lobes of the calyx, the absence of symmetry between the stamina and other parts of the flower, in the structure of the ovarium, which in both is formed by the union of three, mostly monospermous carpels, in the absence of albumen, in the structure of the embryo, having large, thick cotyledons, which become united as the seed advances towards maturity, with a conspicuous plumule, and a disproportionately small radicle. It is interesting to trace these remarkable coincidences in structure between families, which apparently have no real affinity together: for, although the *Hippocastaneæ* are chiefly distinguished from *Tropæoleæ* by

their habit, opposite leaves, and terminal inflorescence, I am not disposed to admit that there exists any relationship between them*.

The *Tropæoleæ,* consisting of *Tropæolum, Magallana,* and the genus now under consideration, form a small group peculiar to South America, and, as far as we yet know, to the portion of that continent included between the 10th and 48th degrees of S. latitude. The three genera are chiefly distinguished by their fruit, for as far as regards the structure of the flower they are pretty much alike.

I shall now proceed to give the essential character and a detailed description of the genus.

CHYMOCARPUS.

TROPÆOLI sp. *Auctt.*

Syst. Linn. OCTANDRIA MONOGYNIA.

Ord. Nat. TROPÆOLEÆ, *Juss.*

CHAR. ESSENT. *Calycis æstivatio* valvata. *Petala* 2. *Pericarpium* baccatum!

DESCR. *Calyx* monophyllus, 5-fidus, subbilabiatus; *labio superiore* trilobo, basi calcarato: *lobis* ovatis, subæqualibus, æstivatione valvatis! *Petala* 2, minima, in labio superiore, spathulata, integerrima. *Stamina* 8, hypogyna, inæqualia: *filamenta* subulata, basi dilatata: *antheræ* obtusæ, tetragonæ, biloculares: *loculis* parallelis, connatis, turgidis: *valvulis* distinctis, involutis, septum constituentibus (subinde antheræ quasi 4-loculares!) demùm longitudinaliter solutis. *Ovarium* triloculare: *ovulis* solitariis, appensis. *Stylus* triqueter, glaber. *Stigma* tridentatum: *dentibus* subulatis, recurvis. *Fructus:* bacca sapida, tricocca: *coccis* monospermis, abortu sæpè solitariis, subglobosis, lævibus.

Herba (Bonariensis) *scandens, radice tuberosâ, perenni.* Caules *filiformes, glabri, purpurascentes.* Folia *alterna, petiolata, quinato-partita:* segmentis *elliptico-oblongis, obsoletè mucronulatis, integerrimis, membranaceis, subtùs glaucis, venis atropurpureis, pollicaribus, basi angustatâ substipitatis;* intermediis *longioribus.* Petioli *filiformes, glabri, bipollicares, virides, plerumque flexu-*

* Since these observations were written, I have seen a learned memoir by Professor Rœper of Basle, intitled, "De floribus et affinitatibus Balsaminearum," in which that acute botanist has also noticed the striking analogies between the *Hippocastaneæ* and *Tropæoleæ.* The latter family he follows Jussieu and others in placing near to the *Geraniaceæ.*

oso-convoluti, cirrhum mentientes. Flores *axillares, solitarii, longè pedunculati, contorsione pedunculi sæpè resupinati.* Pedunculi *assurgentes, filiformes, erubescentes, 3-unciales.* Calyx: tubo *erubescenti:* limbo *viridi, intùs punctis lineolisque sanguineis notato.* Petala *punicea.* Bacca *pulposa, atroviolacea, sapore dulci gratissimo, magnitudine et figurâ ferè* Uvæ minoris.

1. C. *pentaphyllus.*

Tropæolum pentaphyllum. *Lam. Dict.* i. *p.* 612. *Illustr. t.* 177. *Willd. Sp. Pl.* ii. *p.* 299. *Persoon Syn.* i. *p.* 405. *Smith in Rees Cyclop. in loco. DeCand. Prodr.* 1. *p.* 684. *St.-Hil. Pl. Usuel. Bras. t.* 41. *Grah. in Bot. Mag. t.* 3190. *Lindl. in Bot. Reg. t.* 1547.

T. quinatum. *Hellen. Diss. de Tropæolo, p.* 20, *cum tabulâ.*

Habitat in Agri Bonariensis locis arenosis (*Commerson, Tweedie*); in regionibus Cisplatinis. *A. de St.-Hilaire, Sello.* ♃. (v. v. c. et s. sp. in Herb. Linn. fil. et Lamb.)

The name is derived from *χυμος, succus,* and *καρπος, fructus,* in allusion to the juicy nature of the fruit, which forms so remarkable a peculiarity in this genus.

In the calyx, both of *Tropæoleæ* and *Capparideæ,* that variety of imbricate æstivation generally obtains which is termed equitant, the anterior and posterior lobes, which are also most frequently the largest, overlapping and inclosing the lateral ones. The petals in both families are often unequal, lobed and unguiculate; and the anthers adnate, erect, tetragonal, having prominent valves, with involute edges, so as to give them the appearance of being composed of four cells. In habit *Cleome* and *Tropæolum* are not unlike; the leaves in both are peltately lobed; and in *C. violacea* and in the genus *Cleomella* the flowers are strictly axillary and solitary; and were it not that there is a scandent species of *Cleome,* namely, *C. longipes* of DeCandolle, the climbing habit of *Tropæolum* might have been urged against the approximation of the two families. In the flowers of some species of *Cleome,* such, for example, as *C. gigantea,* particularly in the bud state, a considerable gibbosity is apparent at the base of the calyx, which may be regarded as an indication of a spur. On the leaves of *Cleome glandulosa* similar glands occur to those which are observed in *Magallana,* in which genus, it is to be remarked, the ovarium is bilocular, and the stigmata consequently reduced to two.

In *Tovaria,* a genus clearly referrible to *Capparideæ,* the stamina vary from 6 to 9, the stigma is 8-cleft, and the fruit is a round, sessile berry. In the neighbouring group of *Resedaceæ* the stamina are also variable in number, and the stigmata are 3 or 4.

In the *Geraniaceæ,* as has been well remarked by that accurate observer M. Auguste de Saint-Hilaire, the same variety of æstivation occurs as in *Tropæoleæ;* but in the former the styles are simply united, and the anthers incumbent, being attached to the filaments by their middle, with compressed parallel cells, united by a linear connectivum. The stigmata are filiform and pruinose, and the insertion of the stamina rather perigynous than hypogynous. These circumstances, together with what has already been advanced, have led me to dissent from the opinion of some of the most eminent authorities in systematic botany, regarding the affinities of *Tropæoleæ,* whose proper station, I am fully persuaded, is near to the *Capparideæ* and *Cruciferæ.*

IV. *On the Adaptation of the Structure of the Sloths to their peculiar Mode of Life. By the Rev.* William Buckland, *D.D. F.R.S. F.L.S. F.G.S., and Professor of Geology and Mineralogy in the University of Oxford.*

Read March 19th, 1833.

THERE are, I believe, no animals whose structure has been so generally misunderstood by naturalists, and respecting which so many errors have obtained popular acceptance, as the Sloths: they are often quoted, even by the highest authorities in comparative anatomy, as affording examples of imperfect organization, and are proverbially misrepresented, as holding the most abject place in creation, and as constructed only to lead a life of inconvenience and misery.

Cuvier (*Ossemens Fossiles*, vol. v. Part I. p. 72.) observes, that Buffon, after having described with eloquence, and possibly with a little exaggeration, the miserable condition in which the Sloths are placed by the organization of their bodies, says of them, "Tout en eux nous rappelle ces monstres par défaut, ces ébauches imparfaites mille fois projetées, exécutées par la nature, qui ayant à peine la faculté d'exister, n'ont dû subsister qu'un temps et ont été depuis effacées de la liste des êtres." Cuvier further states, that we find in Sloths such few relations to ordinary animals, that the general laws of existing organizations apply so little to them, and the different parts of their body seem so much at variance with the laws of co-existence which we find established throughout the rest of the animal kingdom, that we might really believe them to be the remains of another order of things, the living relics of that preceding state of nature, whose ruins we are obliged to search for in the interior of the earth, and that they have by some miracle escaped the catastrophes which destroyed the other species that were their contemporaries.

The Elephants alone, perhaps, he adds, among the Mammalia, vary in as great a degree as the Sloths from the general plan of Nature in the formation

of this class; but the variations in the Elephant correspond with one another in such a manner as mutually to compensate any inconvenience that might arise from them, and to produce a harmonious result: "mais dans le paresseux chaque singularité d'organization semble n'avoir pour résultat que la foiblesse et l'imperfection, et les incommodités qu'elle apporte à l'animal ne sont compensées par aucun avantage." (*Cuvier, Ossemens Fossiles,* vol. v. Part I. p. 73.) He then proceeds to consider the Sloths, with respect to their peculiarities of organization, as producing slowness and debility.

The skeleton of the *Bradypus tridactylus,* or *Aï,* as represented Pl. 4. *Cuv. Oss. Foss.* vol. v. Part II. affords proportions extremely anomalous and apparently defective; the arm and fore-arm taken together are almost double the length of the thigh and leg, so that when the animal goes on all-fours, he is obliged to drag himself upon his elbows; and if he attempted to stand erect upon his hind-feet, the entire fore-foot would still rest upon the ground: but the *Aï* never can stand upright, because his hind-feet are so ill articulated for walking, that they are unable to support the body in such a position; the pelvis also is so broad, and its cotyloid cavities, or sockets receiving the head of the thigh-bone, are so set back, that the thighs are kept at a distance, strutting outwards, and the knees can never approach one another. The length of the fore-legs embarrasses the animal in its attempts to walk, and its forward movements on the ground are made by fixing its claws on an object, and then dragging its body up to it.

In the above descriptions, which are almost literally translated, the learned author seems to view the structure of this animal, as Buffon had done before him, in relation only to its defects, as ill adapted to the ordinary movement of quadrupeds in walking upon the ground: had he considered its peculiarities in relation to their perfections, with reference to the habit of the animal, living constantly upon trees, and coming to the ground only for the purpose of passing from one tree to another, in those rare cases where it cannot pass from tree to tree without descending, the consideration of this habit would at once have explained all the apparent incongruities of structure; and every organ which appears so anomalous and ill adapted for walking upon the ground, would have been found pre-eminently fitted to supply the wants and comforts of an animal destined to spend its life upon trees.

The extraordinary length of the arm and fore-arm, so inconvenient for moving on the earth, are of essential and obvious utility to a creature whose body is of too great weight to allow it to crawl to the extremity of the branches to collect the extreme buds and youngest leaves, which form its food: these long arms in fact perform the office of the instrument called 'lazy tongs,' whereby the creature brings food to the mouth from a distant point without any movement of the trunk. The structure of the arm, fixed to the shoulder by an universal joint admitting of rotation, and having at the elbow two kinds of articulation, which allow pronation and supination, gives to the hand a power of moving in every possible direction. The breadth of the pelvis and outward position of the thigh-bones, which are also broad and flat, the distance of the knees from one another, and curvature of the bones of the leg, admirably adapt these extremities of the animal to the purpose of clasping, and, as it were, riding upon the trunks and branches of trees: a peculiar condition of life was to be provided for, viz. that of a quadruped which was to feed, to sleep, and, in short, to dwell ntirely upon trees; for the succulent nature of its food renders it unnecessary to descend to drink; and if we look at the anomalous extremities of this animal with a view to their use as instruments of continual suspension upon trunks and branches, the hind-legs performing the double office of adhesion and progression, and the fore-legs the quadruple function of adhesion, progression, prehension and defence, we shall find each article of deviation from ordinary structure adapted to some useful function in its peculiar economy; we shall find a new system of machinery, contrived, and set together, as it were, on a new plan from old materials, (as machines of different functions may be compounded from similar wheels, every motion having relation to some well-defined and useful end,) and the result of these deviations presenting an animal structure not less perfect in reference to its state, than those slender and graceful forms of light and active quadrupeds, with which we usually, and perhaps more justly associate our ideas of perfect symmetry and beauty.

Let us now endeavour to illustrate further some of Cuvier's descriptions of the details of the skeleton of the *Aï*, by considering the adaptation of each part to the habits of an animal living exclusively upon trees, and we shall not only discern no defect or imperfection, but shall find a probable final cause for each

peculiarity that occurs in almost every bone of the skeleton, and these of course corresponding with peculiar structures in the muscles and soft parts of the animal*. Cuvier observes with respect to the articulation of the hind-feet, that it seems contrived expressly to deprive the animal of the power of using them in the act of walking; that whereas, in most animals, the articulation of the ankle with the leg is effected by a hinge more or less pliant, which permits the foot to play upon the leg upwards and downwards, in the Sloth a pointed pivot at the bottom of the *small bone only* of the leg, enters a conical cavity on the upper surface of the astragalus or chief bone of the instep, rendering it impossible for the foot to move vertically in the ordinary manner, and allowing it only to turn horizontally upon the pointed pivot: it follows further, that the sole of the foot is in the same vertical direction with the bone of the leg, so

* Sir Anthony Carlisle, in a paper published in the Philosophical Transactions, 1800, notices a peculiarity in the arteries of the limbs of slowly moving animals. The axillary and iliac arteries which are distributed on the muscles of the upper and lower limbs, are suddenly divided at their entrance to these limbs into a number of equal-sized cylinders, which occasionally anastomose with each other, and are exclusively distributed on the muscles of the limbs, whilst the arteries of all other parts of the body divide in the usual arborescent form. He first observed this structure in the Macauco (*Lemur tardigradus*, Linn.), and subsequently found a similar distribution of the arteries of the limbs in two species of Sloth; in the *Bradypus tridactylus* he counted 42 separate cylinders on the surface of the brachial fasciculus, besides about 20 more, which were concealed within; he found 34 similar branches in the middle of the thigh. In the *Bradypus didactylus,* whose movements are quicker than those of the *B. tridactylus,* he found a similar distribution of the arteries, but to a less degree. As the effect of this subdivision of the arteries is to retard the velocity of the blood passing to the muscles of the limbs, he points out the importance of these phenomena in relation to the physiological question, "whether the slow movement of the blood sent to these muscles be a subordinate convenience to other primary causes of their slow contraction, or whether it be of itself the immediate and principal cause."

Sir Anthony Carlisle also notices the existence of an analogous arrangement of blood-vessels in the carotid artery of the Lion, and suggests, that this peculiarity may be subservient to the long-continued exertion of the muscles of his jaws whilst holding a powerful animal, such as a Horse or Buffalo, and thus enable him to retain his prey.

Kircher in his *Musurgia* states that he received a description of the Sloth from Father Torus, Provincial of the Jesuits in America, who had animals of this kind in his possession, and made many experiments in relation to their nature and qualities. He put a long pole under the feet of one, which it seized upon very firmly, and would not let go again: the animal thus voluntarily suspended was placed between two beams along with the pole, and there it remained without meat, drink or sleep forty days. At last, being taken down, they let loose a dog on it, which after a little while the Sloth seized with his feet, and held him four days, till he died of hunger.

that it never can be placed flat or have a firm tread upon the ground, but if set on the earth would rest on its outer edge. Now there is not one of these peculiarities that is not admirably adapted to render complete the mechanical power of the hind-leg and foot as organs by which the animal is enabled to attach itself most firmly, and as it were with pincers and grappling-hooks, to the trunk and branches of a tree.

The unusual stiffness of the toes and fingers is another peculiarity of the *Aï*, not less fitted to assist its habits of constantly living and feeding upon trees; all the bones of the fingers and toes, except the claw-bones, are inclosed in an undivided skin, and can only move together; the claws alone are separate. The first joints of the fingers and toes are united to those of the metatarsus and metacarpus; the bones of the metacarpus also being consolidated with them into a single piece, which represents what in many animals are 14 small bones. In the hind-foot there is a similar union of the first joints with the bones of the metatarsus, one bone representing what in the more active animals are 17. This stiffness of the parts, which would be inconvenient to an animal moving on the ground, becomes advantageous and a source of strength to one whose constant position and occupation are almost stationary upon a tree. The claws of the Sloth are of unusual length, and form a powerful instrument of defence; with these a Sloth has been known to strangle a dog, holding him at arm's length: on trees also it is most surprisingly tenacious of its hold, and the limbs, though possessing great capability of motion, can fix themselves almost with the rigidity of iron. Mr. Burchell has seen the limbs, even just after death, continue fast clinging round the object to which they were adhering before the animal expired.

The Sloth has till very recently been supposed to present a most extraordinary deviation from the normal character of all Mammalia in the number of its cervical vertebræ; all other Mammalia, from the Giraffe and Camel, down to the Cetacea, have invariably seven, while the Sloth was considered to have *nine*. Mr. T. Bell* has lately ascertained, by the dissection of two specimens of the *Bradypus tridactylus*, that the two lowest of these supposed cervical vertebræ are in reality dorsal, having two small and short rudimentary ribs attached to each of them, which have been hitherto overlooked in the dissec-

* See paper read before the Zoological Society of London, August 13th, 1833.

tions of this animal*. The unusual position, however, of these two anterior dorsal vertebræ, so far in advance of the clavicle and scapula, enables them to cooperate with the seven true cervical vertebræ in increasing the rotatory motion and flexibility of the neck. Hence the animal has the unusual power of looking backwards over its own shoulders. We see a final cause for this arrangement in the peculiar habits of the Sloth; being always engaged in the act of climbing and clinging with its face towards the trunk or branches of a tree, with its eyes also almost hidden in long hair, to defend them from insects, it could not easily see without a greater flexibility of neck than quadrupeds usually possess. Mr. Burchell has observed that this animal can in a remarkable manner and with great facility twist its head quite round, and look in the face of a person standing directly behind it, while at the same time the body and limbs remain unmoved; as the creature, thus embracing and attached to the trunk or branch of a tree can keep no look-out in front, the increased flexibility arising from the unusual disposition of these two anterior dorsal vertebræ may be considered as a compensation, enabling it to see and guard against the approach of its enemies in flank and rear, as well as to see the position of its food; the habits of the Sloth are unique among quadrupeds, and so also is this compensation. Another advantage resulting from this unusual flexibility may be to afford ease to the neck under the peculiar position which the Sloth assumes in taking its repose. In the case of an animal, great part of whose life, when not engaged in eating, is spent in sleeping on trees, an easy attitude for repose is most essential to its comfortable existence; and accordingly we find, that the auxiliary vertebræ at the base of the neck contribute to produce that flexibility of this organ which allows the head of the animal to incline forward and rest upon its bosom. Mr. Burchell observed that his captive Sloths assumed during sleep a position of perfect ease and safety on the fork of a tree, their arms embracing the trunk, their backs resting in the angle

* Dr. Harlan, in a highly interesting and admirable memoir on the Anatomy of the Sloth, which did not come under my observation until this paper was passing through the press, states, "that in a *Bradypus tridactylus* which he dissected, the 9th cervical vertebra supported at the extremity of the transverse process an osseous rudiment of a rib, to which it is joined by cartilage:" but he does not proceed, as Mr. Bell has done, to draw from this fact the important conclusion, that the presence of rudimentary ribs causes the vertebræ to which they are attached to be dorsal and not cervical.—See Featherstonhaugh's American Journal of Geology and Natural Science, page 501, May 1832.

of a branch, and their heads reclining on their own bosom. The animal is thus rolled up nearly to the form of a ball; the entire vertical column, including the neck, assumes a nearly circular curve; and not only is the weight of the whole body maintained in an attitude of ease and safety, but the head is supported between the arms and chest, and the face lies buried deep in the long wool which covers these parts, and is thus protected during sleep from the myriads of insects that would otherwise attack it.

The teeth of the Sloth also present peculiarities which are in harmony with the other characters of the animal; there are no incisors, because the leaves are brought to the mouth, being collected from the branches by the powerful claws which terminate the hand and perform the office of incisors. Besides the four canine teeth, there are on each side four molars in the upper and three in the lower jaw. The construction of these teeth is the most simple that exists; they are composed of a cylinder of bone, encased with enamel, and hollow at the two extremities; the upper cavity being produced by the act of mastication, which wears away the softer bony substance of the interior more readily than the exterior enamel, and the lower cavity being filled with gelatinous pulp, which maintains the continual growth of the tooth; these simple teeth being employed exclusively in the mastication of buds and leaves, are fully adequate to the wants of an animal which has no need of the more complicated compound tooth of quadrupeds that feed on the ground, and masticate vegetables of a harder or more miscellaneous kind.

Should the above criticisms be correct, which I have presumed to make on almost the only passage in the works of Cuvier that I do not read with entire assent and admiration, the construction of the Sloth is not only relieved from the imputation of feebleness or imperfection, and still more from the charge of monstrosity; but adds another striking case to the endless instances of perfect mechanism and contrivance which we find pervading every organ of every creature, when viewed in relation to the office it is destined to fulfil; and affords a new exemplification of the principle, which has been so admirably illustrated by the judicious Paley, "that the animal is fitted to its state."

The views we have been taking of the anatomy and economy of the Sloth are abundantly confirmed by the observations on the habits of this animal, published by Mr. Waterton in his Wanderings in South America. "This sin-

gular animal," he observes, "is destined to be produced, to live and to die on trees; he inhabits remote and gloomy forests: from the descriptions which have been given of the Sloth, you would suspect that no naturalist had gone into the wilds to examine his haunts, and see whether Nature has committed any blunder in the formation of this extraordinary creature. As the Indians and negroes are the people who usually catch the Sloth and bring it to the white man, it is probable the erroneous accounts we have hitherto had of the Sloth have arisen from examining the animal in those places where Nature never intended he should be exhibited.

"Some years ago I kept a Sloth for several months: I often took him out of the house and placed him on the ground in order to have an opportunity of observing his motions; if the ground were rough, he would pull himself forwards, by means of his fore-legs, at a pretty good pace; and he invariably shaped his course towards the nearest tree; but if I put him upon a smooth and well-trodden part of the road, he appeared to be in trouble and distress: his favourite abode was the back of a chair; and often getting all his legs in a line upon the topmost part of it, he would hang there for hours together. The Sloth in its wild state spends its whole life upon trees, not *upon* the branches, but *under* them; he moves suspended from the branch, he rests suspended from it, and he sleeps suspended from it; hence his seemingly bungled conformation is at once accounted for. One day, crossing the Essequibo, I saw a large two-toed Sloth on the ground upon the bank; though the trees were not twenty yards from him, he could not make his way through the sand time enough to make his escape before we landed: he threw himself on his back, and defended himself with his fore-legs: I took a long stick and held it for him to hook on, and then conveyed him to a high and stately mora; he ascended with wonderful rapidity, and in about a minute he was almost at the top of the tree; he now went off in a side direction, and caught hold of the branch of a neighbouring tree; he then proceeded towards the heart of the forest."—For more full details of his very interesting account of the Sloth tribe, I must refer my readers to Waterton's Wanderings, pp. 161, 284.

I am indebted to my friend Mr. Burchell for the following account of his personal observations on the habits of the Sloth during his late travels in South America. At Santos in Brazil, in 1826, Mr. Burchell kept a tame Sloth, a

Bradypus tridactylus, which at the end of two months pined and died; it fed exclusively on the buds and leaves of a species of *Cecropia,* a tree having a slender stem of thirty or forty feet long, with horizontal branches, hollow internally, and naked, except at the extremities; these trees grow only in damp places. Mr. Burchell made use of the upper part of the trunk of one of them, which is merely a hollow tube, as a case for his barometer; the Sloth ate only the young shoots and terminal buds of the unexpanded leaves, rejecting the old leaves, on the boughs which were brought to it daily; it was always perfectly silent, and its countenance and manners were most expressive of melancholy; it fed by day, and slept much; being kept in a room, it sate upright upon its short tail, embracing the legs of a chair with all its legs. When wild, it often sleeps in the fork of a tree; it travels along the branches with its body downwards. The young cling round the body of the mother: see Plate of *Bradypus tridactylus,* in Prince Maximilian of Neuwied's Animals of Brazil, 1823, livr. 2.

When resident at Para, near the mouth of the Amazons, Mr. Burchell also kept two full-grown Sloths and a young one of a three-toed species (not *Bradypus tridactylus,* but of nearly similar form and habits,) in a garden inclosed with strong stockades: they were kept tied up to the pillars of a verandah to prevent their escape; against these pillars they always placed themselves in an erect position, embracing the pillar with all four legs; when not tied to the verandah, they got up into trees in the garden; they slept both day and night, always fixing their arms round something or other; their food, consisting of branches, was brought to them in the verandah; they appeared extremely stupid, and would never come to the food; they would eat no leaves but those of the *Cecropia.*

They did not mount very large trees; they ascended with their breast pressing the trunk of the tree, advancing the hind-leg beyond the fore-leg. On the ground they could neither stand nor walk, but lay sprawling on their belly, and dragged, or rather warped themselves along, laying hold of a bunch of grass or a stone with their three claws, which operated like grappling-irons, or rather pincers. All these died in a month or two. In their wild state they are seldom seen, from their colour mingling with the grey foliage of the trees, and from their being so extremely quiet and slow.

The tame Sloths never willingly remained on the ground, except to pass from one tree to another: all the movements of the animal are slow; it moves its claws or pincers slowly; in eating it chews slowly; it also climbs slowly; the moisture of the leaves it eats suffices it for drink, without descending to obtain water. None of those kept by Mr. Burchell were ever seen to drink. The full-grown animals were never heard to utter any sound, but the young one occasionally (though rarely) gave a short cry or whistling squeak of a single note.

They showed no indication of fear, and seemed to give attention only with their eyes; they took no notice of the boy that carried them often across the garden to their place in the verandah, with their long arms sprawling; the only objects of their regard were trees; they fight on their backs, and grapple their enemy to strangulation. The use of the long wool that covers the body, and even the face, seems to be to guard them from the annoyance of insects.

The following descriptions in Piso and Marcgraf's Natural History of Brazil, p. 221, are evidently the result of personal observation on the habits of the Sloth, and confirm in every respect the views we have been taking of the structure and habits of this animal.

"Animal est ignavissimum et ad incessum plane ineptum, in arboribus lentissime rependo progreditur, ibi habitat, foliis arborum vescens; nunquam bibit, vocem rarissime edit iiiii, fere ut felis junior: arctissime, quæcunque unguibus apprehendit, tenere potest. Quando scandit, caput elevatum lentissime movendo gestat. Pluviam etiam levem admodum metuit."—"Animal sine dubio vivax. Intestinis omnibus exemptis adhuc se movebat, et pedes contrahebat ut vivum solet quando pendens ad somnum se componit. A junctura pedis cum tibia tres nervi solidissimi, ad quemlibet unguem unus intensus tendit, quibus ungues incurvare et validissime se sustentare potest*."

Does it not follow from the above comparisons of the habits of the Sloth with its form and structure, that so far from being in any respect an imperfectly constructed animal, it is fitted with admirable perfection of mechanism to its unusual habits and peculiar condition of life? It is true, that if rapid locomotion be an essential attribute of a quadruped, the Sloth will labour under

* *Pis. et Marcgr. Hist. Nat. Bras.* p. 221.

the imputation of debility; but we have seen, that agility and activity would have been superfluous to an animal that has no occasion to run or walk, and that the slow and torpid movements of its arms and claws cause no inconvenience to a creature whose food is stationary upon trees. Adhering continually to their trunks or branches, it finds in this position protection from the assaults of terrestrial quadrupeds, whilst its strength of arm and length of claws sufficiently defend it against the serpents, which are its most formidable enemies. The charge of imperfection, therefore, can with no more justice be advanced against the construction of the Sloth because its locomotive powers upon the ground are slow, than against the structure of fishes, because they are not furnished with legs.

V. *Observations on* Naticina *and* Dentalium, *two Genera of Molluscous Animals. By the late Rev.* Lansdown Guilding, *B.A. F.L.S.*

Read June 21st, 1831.

THE zoologists of the old school, regarding only the shells, have always considered the *Naticæ* as closely allied to the true *Neritæ* of Linnæus, and have obstinately retained them under the same generic title, rejecting all the subgenera so properly instituted by modern writers. A very slight acquaintance with the animals will convince us that the *Naticidæ* form a distinct family from the *Neritidæ,* the two groups differing in many most important characters. The former are apparently blind; the operculum has no appendages; their useless tentacula are weak and turned back on the shell, while in the act of creeping the head and its organs are perfectly veiled by a broad expanded hood (*cucullus*), the sensitive contractile apex of which serves to guide its motions. At first sight they rather resemble the *Bullidæ* than the *Neritidæ:* for these have prominent eyes, an exposed head and long projecting sensitive tentacula, and the operculum has testaceous appendages for firmer insertion into the foot. I have transmitted a drawing and description of the typical species of *Naticina* to my friend Mr. Swainson, who has promised to insert many of my drawings of West Indian shells in his beautiful work, entitled "Zoological Illustrations."

MOLLUSCA.

Fam. Naticidæ, *Guild.* Neritidæ, *Gray.*

Genus 1. Natica, *Guild.* Naticæ pars, *Sowerby.*

Character genericus.

Testa subglobosa v. obovalis, rarò depressiuscula.

Spira brevis: *apertura* integra, semiorbicularis, latere columellari obliquo, edentulo, calloso.

Umbilicus profundus, sæpè latus, inter columellarium contractum benè separatum atque columellæ basin spiralem et sæpè incrassatam positus: *fossulá* ante callositatem, ferè distinctâ.

Peritrema acutum, internè lævigatum.

Operculum testaceum, superficie totâ affixum, nunc cœlato-costatum, nunc planatum, spirâque ejus antico-internâ.

Typus. *Natica caurena,* Sow. Gen. f. 1.

Genus 2. NATICINA, *Guild.* (Naticæ diminutivum.) Natica, *Sow., Lam.*

Character genericus.

Animal cæcum *, cucullatum.

Caput absconditum, parvulum, papilliforme.

Os subtùs, cartilagineum, proboscidiforme, intra caput retractile.

Mandibulæ binæ, æquales, corneæ, marginibus denticulatis.

Tentacula spuria, longa, debilia, subdepressa, retractilia, apicibus recurvis; basi tecta, et membranâ supra caput connexa.

Cucullus latus, corpus testamque anticè tegens, margineque antico pedi connexus: dum pascit animal detrahendus.

Pallium tenue, continuum, latera testæ protegens.

Operculum corneum, simplex, spirâ antico-internâ, cicatrice parvulâ. *Musculus opercularis* † lateralis, contractus. *Musculus adhæsionis* ventralis, latus, cartilagineus, candidus.

Pes valdè contractilis et mutabilis, latus, magnus, subdiaphanus, anticè cucullum recipiens.

Solea simplex, marginibus tenuibus.

Anus pallio absconditus, sinister?

Branchiæ subdorsales.

* In general aspect the *Naticinæ* approach the *Bulla Hydatis* described by Montagu in the Linnean Transactions, vol. ix. t. 6. f. 1. p. 106.—This animal, however, like its congeners, has distinct eyes seated in the subdiaphanous disk of the hood.

† The operculum is here only partially affixed to allow of freer motion. In *Strombus* the elongate lid is attached only by one end, the other being used as a crutch: when reversed, it easily recovers its position by this singular use of the organ; hence the point is generally worn and uneven.

Testa lævis, (*epidermide* tenui caducâ,) *Naticæ* similis, longitudinalitèr plicatula, anfractu basilari subitò valdè incrassato, reliquis minutis.

Umbilicus quasi semiclausus: in adultis callositate effusâ nonnunquàm omninò clausus.

Columellæ callosæ basis, vix à columellario depressione transversâ parvulâ distinguenda: fossula ejus antica sæpiùs lata.

* *umbilico clauso.* N. Mammilla, *Lam.*

** *umbilico aperto.* N. lactea, *Guild.*

Typus. *Naticina lactea.*

N. tota flavescente-lactea, capite rufescente, abdomine nigrescente-flavido, operculo castaneo margine diaphano.

Testa ovalis, ventricosa, lactea, nitida, spirâ prominulâ, anfractibus septem epidermide fuscescente-ferrugineâ tectis, apicalibus nudis minutis.

Nerita Mammilla, *var.* C. *Dillwyn Cat. vol.* ii. *p.* 985. *Lister Conch. tab.* 571. *f.* 22?

Habitat in profundis Oceani Caribæi frequens, nec cum *Neritis* littora petens.

Axis $1\frac{[illegible]}{10}$ unc.—Diam. $\frac{[illegible]}{10}$ unc.

It is commonly found in all collections of West Indian shells, though the epidermis and operculum are rarely preserved. Lamarck's description of the animal of *Natica* seems to me imperfect. The eyes it is said to possess are either wanting in *Naticina*, or escape observation from their paleness. Mr. Gray, the zealous author of the *Spicilegia Zoologica*, has with great judgement pointed out the affinity of *Sigaretus* to *Natica*. Its proper place in the family I shall explain hereafter.

The shell before us is very different from the Asiatic *N. Mammilla* of Lamarck, and the *N. mammillaris*, Lam., the var. B. of Dillwyn, which occurs in these seas.

Dentalium.

The nature and proper station of *Dentalium* were involved in much confusion till the observations of M. Deshayes were made known to us. A translation of his interesting memoir is given in the Zoological Journal, and is of great value to the student. The specimens which this naturalist examined

having been contracted from immersion in spirit, did not enable him to complete his history of the animal, and it is probable much will remain to be noticed till we can obtain the inhabitants of some of the larger shells. Having lately dredged up a small specimen about $\frac{9}{16}$ths of an inch long, I hastened to make a highly magnified figure of it before its death, and my trifling addition to the memoir of M. Deshayes is now offered to the Linnean Society, not without the hope that my description may soon be rendered more perfect by the aid of larger specimens. The minuteness of the example I obtained did not allow me by dissection to ascertain many particulars recorded in the memoir alluded to. The head, jaws, mouth, and lips, the muscular ring of adhesion, the anal funnel-shaped expansion, and the horse-shoe cicatrix on the shell, escaped my notice. What M. Deshayes has described as the *liver*, I should rather suppose to be the branchiæ, notwithstanding their unusual livid colour. These organs are regularly and deeply pectinated, and resemble a long-handled comb. The numerous elongate subcapitate anterior organs I would call tentacula: their extremities appear to be suctorious. Whether the convex side is properly called the back I did not determine; my specimen certainly drew itself along on its side, but this may have been owing to the shallow layer of sand in which it endeavoured to bury itself in the soup-plate which contained it, where it might not have been able to assume its proper attitude. From residing under the loose sand, their shells are of course free from extraneous matter, though not shielded by the pallium. The creature moves tolerably quick by sudden interrupted steps. When disturbed, it retreats quickly into its shell, which has no operculum as the *Serpulidæ*. After a time the cloak is protruded, the tentacula set in motion, and the vermiform active foot partially thrust out to explore its path, as at Tab. III. fig. 1.: when it wishes to proceed apace, the foot, with its petal-shaped alæ closed round the stem, is protruded to its full length, as at fig. 3.: the alæ are then suddenly expanded, as at fig. 4.; and the base of the foot being forcibly contracted, the shell is brought forward, while these expansions laid open in the sand prevent the apex of the foot from losing its advanced position. In drawing up descriptions, we must be careful how we speak of the absence of the anal fissure or rima. In recent specimens the apex is often produced to a very fine thin point, which with the whole fissure is very easily worn off, and seldom likely to occur in fossil examples, or shells

which are picked up dead. The small species for safety should be glued on blackened card. I do not observe that the fissure is always dorsal; in my specimens it is either lateral or ventral.

Of the place of *Dentalium* in the natural system I will not venture to speak at this moment, though perhaps we shall not do wrong, in the present state of our knowledge of the *Mollusca*, in placing it near the great family, or, I should rather say, great tribe of Linnæan *Patellæ*. In its anal opening it resembles the genus *Fissurella*, while the apical fissure represents the posterior marginal rima of *Emarginula*.

The substances figured by Mr. Sowerby in his accurate illustrations of the Genera of Shells, fig. 9, are in no way connected with *Dentalia*, though I do not pretend to determine their real nature. Their closed mouth and the connecting corneous ligaments are very curious. I have lately dredged up, among sea-weeds, numerous specimens of an animal (*Oikodomicus*, Guild.) much more analogous in outward look to the true *Dentalia*. The habitaculum is diaphanous, tubiform, vitreous, slightly bent, symmetrical, having the termination softer but not attenuated. It does not possess the hard calcareous body of the shells before us; but if Cuvier himself had received the empty habitacula, he might have thought them good *Dentalia*. The animal, however, is not affixed, but is closely related to *Nereis*. It is a most singular, active and entertaining animal in its captivity, and shall be fully noticed hereafter.

MOLLUSCA.

Statio generis in systemate adhuc dubia sistit, at forsitàn prope Emarginulas.

Genus. Dentalium. *Auctorum.*

Animal arenicolum, valdè elongatum, testæ figuram exhibens, dorso arcuato.

Corpus anticè truncatum, posticè mollius, subdiaphanum, musculis lateralibus elongatis.

Caput anticum, absconditum.

Tentacula cervicalia, numerosa, elongata, subcapitata, apicibus suctoriis?

Pallium tumidum, plicatum, pedis basin cingens.

Branchiæ duo, pectiniformes, abdominales?

Pes terminalis, magnus, extensus, subcylindricus, subattenuatus, vermiformis,

contractilis, subcanaliculatus: *lobis* petaliformibus, medio caulem amplectentibus, et (dum serpit animal inter arenulas,) inter utrumque passum subitò et fortitèr deflexis.

Anus terminalis, nonnunquàm appendiculis ut (primò observante D. Sowerby,) in *D. fissurâ* instructus.

Testa symmetrica, testacea, tubo-spiniformis, levitèr arcuata, versus apicem sensìm attenuata, raró tumida, anticè truncata: concavitate ventrali utrinque apertâ: foramine antico magno, circulari, sæpiùs simplici: foramine postico minori, sæpissimè in recentibus fissurato. *Rima* contracta. *Operculum* nullum.

Genus sic dividendum: forsitàn hæ divisiones mox in subgenera plurima erigendæ, at (incolis invisis) monente Ovidio,

"Eximia est virtus præstare silentia rebus."

I. Testâ apice simplici.
  - *a.* Testâ longitudinalitèr striatâ vel costatâ. *Dent. elephantinum,* Linn., Desh.
  - *b.* Testâ lævigatâ. *Dent. entalis,* Linn., Desh.
  - *c.* Testâ apice tubiferâ. *Dent. Sowerbyi,* Guild.

II. Testâ apice fissuratâ.
  - *a.* Testâ longitudinalitèr striatâ vel costatâ. *Dent. striatum,* Born, Desh. *Dent. semistriolatum,* Guild.
  - *b.* Testâ lævigatâ. *Dent. eburneum,* Linn., Desh.
  - *c.* Testâ transversè plicatulâ. *Dent. circinatum,* Sow. Gen. f. 5.

III. Aperturâ contractâ, apice bifissuratâ. *Dent. coarctatum,* Lam., Desh.

IV. Testâ margine incrassatâ, apice simplici. *Dent. strangulatum,* Desh.

1. Dentalium semistriolatum, *Guild.*

D. lacteum, abdomine diaphano pallido, branchiis? lividis.

Testâ niveo-vitreâ, apice acutâ fuscâ, anticè lævigatâ, posticè longitudinalitèr creberrimèque striolatâ.

Long. testæ $1\frac{3}{16}$ unc.—Diam. $\frac{1}{16}$.

Var. β. fig. 6. testâ candido pulchrè undulato-cinctâ.

Habitat in arenosis Oceani Caribæi.

2. Dentalium Sowerbyi.

Animal ignotum.

Testâ parvulâ, sublævigatâ, transversìm indistinctè subplicatulâ, apice tubiferâ.

Habitat semel cum præcedente.

Long. testæ $\frac{12}{84}$ unc.

Testa quasi posticè tubo duplicato, nec monstrosa.

EXPLICATIO TAB. III.

1. *Dentalium semistriolatum,* tentaculis extensis.
2. Testa vacua.
3. Pes extensus ante passus.
4. Pes contractus alæque extensæ dum testa trahitur.
5. Apertura testæ (incolâ retractâ).
6. Var. β.
7. *Dentalium Sowerbyi.*

L. Guilding del. D. Allen sc.

VI. *Monograph of the East Indian* Solaneæ. *By* Christian Godfrey Nees von Esenbeck, *M.D. F.M.L.S., President of the Imperial Academy Naturæ Curiosorum, and Professor of Botany in the University of Breslau.*

Read November 20th, and December 18th, 1832.

SOLANEÆ.

Rob. Brown, Prodr. Fl. Nov. Holl. i. *p.* 443. *ed. N. ab E. p.* 299. *Juss. Gen. p.* 124. *Lindl. Synops. p.* 180. *Introduct. p.* 231. *Bartl. Ord. Nat. pp.* 122. *et* 193.

I. Solanum.

Calyx quadri- quinque- octo- decem-fidus dentatusve persistens. *Corolla* rotata rariusve campanulata plicata, quadri—quinque-fida vel sinuato-angulata. *Antheræ* conniventes apice poro gemino dehiscentes, æquales vel inferiores quædam magis productæ. *Bacca* bi- rarius pluri-locularis, polysperma, nuda. *Semina* glabra.

Sect. 1. *Maurella.*

A. Pedicellis fructus pedunculum communem (fortiorem) subæquantibus (vel superantibus).

1. *Solanum fistulosum*, Rich.

S. annuum, ramosum, caule fistuloso angulato, foliis ovatis acumine obtuso subrepandis basi in petiolum anguste decurrentibus, pedicellis fructus pedunculum communem æquantibus, (polline flavo).

α. Baccis nigris.

Solanum fistulosum. *Rich., Dunal Syn. p.* 12. *n.* 49. *R. et Sch. S. V.* iv. *p.* 587.

Solanum nigrum fructu nigro e Kurigong in Herb. Hamilt. *Wall. Catal. n.* 2615, F.

Solanum Rhinocerotis. *Blume, Bydragen, p.* 695 ?

Solanum nigrum. *Wall. Catal. n.* 2615, M. ex Henzeda alibique juxta ripam Irawaddi fl.

Herb. Wight. propr.

β. Baccis rubris.

Solanum rubrum. *Linn. S. Nat. ed. Gm. p.* 384. *Willd. Sp. Pl.* i. 2. *p.* 1034.

Solanum erythræum. *Dun. Sol. p.* 238. *R. et Sch. S. V.* iv. *p.* 660.

Solanum nigrum fructu rubro. Herb. Hamilt. *Wall. Catal. n.* 2615, H.

Adnot. Simile *Solano nodifloro* et *S. guineensi.* Differt ab utroque præsertim pedunculis fortioribus brevioribus, foliis sæpe, at obiter, repandis, cauleque angulato; ab hoc foliis magis obtusis, floribus minoribus, antheris brevioribus, polline flavo (nec violaceo).

2. *Solanum incertum.* Dun.

S. annuum, ramosum, diffusum, caule angulato, angulis lævibus denticulatisve, foliis deltoideis deltoideove-oblongis triangulari-acuminatis medio sinuato-dentatis, pedicellis fructus reflexis pedunculum communem æquantibus.

α. Foliis angustioribus argute sinuato-dentatis, fructu rubro luteove, caule scabriusculo.

Solanum nigrum. *Wall. Catal. n.* 2615, B. et G., ex Oude (Herb. Wallich.), ex Rungpur (Herb. Hamilt.); tum *Wall. Catal. n.* 2615, C. ex Herb. Russell. (ex parte).

β. Foliis late deltoideis parce angulatis subhastatove-angulatis.

* *Fructu rubro croceove.*

Solanum nigrum. *Wall. Catal. n.* 2615, C. (ex parte), ex Herb. Russell. L. (e Sillet).—Solanum nigrum. *Forsk. Fl. Æg. Arab. p.* 46.

Solanum miniatum. *Bernh., Willd. En. Hort. Berol.* i. *p.* 236. *Dun. Sol. p.* 156. *n.* 39.

Nelan Tsjunda. *Rheed. H. Mal.* x. *p.* 145. *tab.* 73. (figura optima).

Solanum nigrum. *Wall. Catal. n.* 2615, N. Hort. Bot. Calc. et Herb. Finlayson, (ex parte).

** *Fructu nigro.*

Solanum nigrum *var.* melanocerasum. *Wall. Catal. n.* 2615, F. (e Nepalia).

(Exempla imperfectiora sunt, quam quibus certo constet, utrum ad hanc pertineant speciem an ad *Solanum nigrum* commune.)

Habitat in Indiæ arenosis (*Rheede*); in Sillet (*Wall.*). Varietas β. in Nepalia (*Wall.*).

Adnot. Cirri, quos in Solano incerto (ex icone Rheediana) memorat Dunalius, pedunculi sunt, delapsis fructibus persistentes.

B. Pedicellis fructus pedunculo communi brevioribus.

3. *Solanum rubrum.*

S. annuum, ramosum, diffusum, caule angulato costaque foliorum angulis denticulatis, foliis ovato-oblongis basi apiceque attenuatis repando-dentatis, pedicellis fructus divaricatis pedunculo communi gracili brevioribus, (polline luteo).

α. Baccis rubris croceisve, floribus minoribus.

† *Caule foliisque glabriusculis.*

Solanum rubrum. *Roxb. Fl. Ind. Or.* ii. *p.* 216. *n.* 4. *Mill. Dict. n.* 4. *Dun. Sol. p.* 155. *n.* 37. *R. et Sch. S. V.* iv. 590.

Solanum nigrum η. rubrum. *Willd. Sp. Pl.* i. *p.* 1036.

Solanum Rumphii. *Dun. Sol. p.* 157. *n.* 42. *R. et Sch.* l. c. *p.* 591.

Halicacabus Indicus minor niger. *Rumph. Herb. Amb.* vi. *tab.* 26. *f.* 2. (Varietas foliis—quod sæpe accidit—minus profunde serratis et paullo magis puberulis*.)

Solanum nigrum. *Wall. Catal. Herb. Madr. et Herb. Calc.* (ex parte).

Solanum asperum. *Hornem., Herb. Günther.* (e California).

Solanum nigrum, fructu rubro. *Wall. Catal. n.* 2615, A, B (ex parte), D, E, K, L.

†† *Caule* (*dentato*) *foliisque hirsutis, his eroso-dentatis.*

Solanum Rumphii. *Blume, Bydr. p.* 695. (nec *Dun.*).

Solanum chenopodioides. *Lam. Ill. Gen. n.* 2340. *Poir. Enc. Meth., Suppl.* iv. *p.* 290. *Dun. Sol. p.* 157. *n.* 41. *Feuill. Per.* ii. *t.* 14. (baccæ aquose pallidæ).

* Dubium non est, quin Rumphii *descriptio*, l. c. p. 61. exhibita, ad *Physalidem minimam* Linn. spectet, quam ab Halicacabo Indico majore (tab. 26. f. 1.) seu *Physalide angulata* Linn. bene distinxit auctor, sed iconem falsam Solani nostri addidit.

Solanum nigrum. *Herb. Heyn.* (ex parte).

β. Baccis nigris, floribus majoribus.

Solanum oleraceum. *Rich. Herb., Dun. p.* 12. *n.* 51. *R. et Sch. S. V.* iv. 588.

Solanum nigrum. *Blume Bydr. p.* 694.

Solanum nigrum, fructu nigro. *Wall. Cat. n.* 2615, F. (ex Hort. Bot. Calc.).

Crescit var. α. frequentissima omnium in India Orientali. In hortis, omni tempore florens fructumque ferens (*Roxb.*). In Java insula (*Blume*); in Amboina (*Rumph.*). In California (*Bernh.*, fide Herb. Günth.; var. [culta?] foliis latioribus). Vidi exempla e Nepalia, ex Oude, e Bengalia: ex Herbariis Wightiano, Heyneano (ex parte). Varietatis α.†† exemplum (villosæ) in Herb. Heyneano, *Solani nigri* nomine, offendi. Var. β. habitat in America calidiore coliturque inter tropicos. Vidi exempla in Herb. Güntheriano (*Sol. oleraceum* et *chenopodioides*), tum ex Horto Bot. Calcuttensi.

Var. α.††, quæ, quoad flores, simillima, differt: caulis dense cano-villosi angulis magis muricatis, foliisque subrhomboideis, ad apicem usque eroso-dentatis villosis obscuris. Exemplum nostrum non sufficit ad omnia explicanda.

Var. β., quæ *S. oleraceum* Rich., quod ad folia et caulis integumentum ac murices accedit varietati α.†, et differt floribus paullo majoribus baccisque nigris.

Adnot. Solanum rubrum differt a *Solano incerto* seu *miniato* et S. *nigro:* caule magis elongato vagoque, angulis, petiolis subtus costaque foliorum muriculatis, pube strigulosa apices novellos canos reddente, foliis utrinque attenuatis angustioribus mollioribus nunquam deltoideis, pedunculis communibus valde gracilibus, umbella florente ratione parva brevique terminatis, baccis minoribus.

Tropica forma Maurellorum esse videtur, quæ, etiam culta, aucta tantum parumper foliorum florumque mole fructusque colore ludente, perstat.

Sect. 2. *Geminifolia, integrifolia, inermia.*

4. *Solanum spirale.* Roxb., Wall. Catal. n. 2619.

S. caule fruticoso, ramis compresso-angulatis glabris, foliis geminis oblongo-lanceolatis basi attenuatis glabris integerrimis, altero duplo triplove minore, racemis subcymosis suboppositifoliis secundis apice revolutis, calycibus glanduloso-punctatis.

Solanum spirale. *Roxb. Fl. Ind. Or.* ii. *p.* 247. *n.* 6. *Wall. Catal. n.* 2619, A. e Silhet, *F. de Silva,* et nuperius *Gul. Gomez.*

Solanum Naratida. *Herb. Hamilt.*

Crescit in Silhet (*Roxb.*), in Gualpara (*Herb. Hamilt.*).

Simile *Solano tristi* Jacq., a quo præsertim differt: ramis angulatis, foliis basi longe cuneatis, acutis, nec acuminatis, semper integerrimis, floribus majoribus albis, calycibusque glandulosis.

5. *Solanum membranaceum.* Wall. Catal. n. 2625, A.—C.

S. caule herbaceo dichotomo, foliis geminis ovatis oblongisve utrinque acuminatis basi obliquis inæqualibus supra hirtis, floribus subgeminis axillaribus, calycis quinquedentati dentibus subulatis.

Solanum membranaceum. *Wall. Catal. n.* 2625, A. et C. e jugo Nilghiry dicto D. Noton, et in Herb. Madr. cum *Sol. bigeminato* e Travancore.

6. *Solanum læve.* Dun.

S. caule herbaceo dichotomo, foliis geminis ovatis utrinque acutis inæqualibus glabris, floribus subgeminis axillaribus, calycis quinquedentati dentibus subulatis.

Solanum læve. *Dun. Syn. p.* 22. *n.* 126. *R. et Sch. S. V.* iv. *p.* 607. *n.* 132.

Solanum membranaceum. *Wall. Catal. n.* 2625, B.

Crescit in India Orientali. Vidi in Herb. Heyneano et in Herb. Wight. propr. n. 100, 101, 105, 127.

7. *Solanum denticulatum.* Blume.

S. caule suffruticoso, foliis inferioribus solitariis, superioribus geminis glabriusculis, altero majore oblongo utrinque acuminato, altero minori subovato, floribus fasciculato-aggregatis laterifoliis, calyce minutim decemdenticulato sulcato.

Solanum denticulatum. *Blume, Bydr. p.* 697.

Solanum subtruncatum. *Wall. Catal. n.* 2620.

Crescit in montibus Silhet (*Wallich*); in umbrosis altioribus montium Gede, Burangrang &c. Javæ insulæ (*Blume*).

Adnot. Cl. Blume l.c. varietatem foliis, pedunculis, calycibusque hirsutis (α.), alteramque pedunculis solitariis floribusque abortu tetrandris descripsit.

8. *Solanum bigeminatum.* N. ab E.

S. caule suffruticoso, foliis inferioribus solitariis superioribus geminis supra dissite setulosis elliptico-oblongis utrinque acuminatis, altero minori conformi, floribus laterifoliis subgeminatis, calyce integerrimo lævi, pedunculis fructus erectis.

Solanum flexuosum (et angulosum) *Herb. Madr.* e Travancore. *Wall. Catal. Suppl.*

Differt a cognatis, quæ calyce gaudent integro, fructu grandiore, pisi eximii magnitudine, pedunculo crasso erecto insidente.

9. *Solanum Neesianum.* Wall.

S. caule suffruticoso ramis tetragonis summitatem versus scabriusculis, foliis inferioribus solitariis superioribus geminis, supra dense subtilissimeque scabris punctulato-asperulis oblongo-lanceolatis utrinque acuminatis, altero minori conformi, floribus laterifoliis fasciculatis, calyce integerrimo lævi, pedunculis fructus patentibus.

Solanum Neesianum. *Wall. Catal. Suppl. n.* 248.

Crescit in montibus Silhet. *Guil. Gomez.*

Ab affinibus differt pubescentia paginæ superioris foliorum exigua scabra tuberculis innata, et punctis parvis elevatis superficiei inferioris, quæ asperam eam reddunt. *Rami* fere tetragoni flexuosi simili modo punctulis inspersi sunt et asperi. *Folia* angustiora etiam sunt magisque lanceolata; alterum socio suo duplo minus. *Flores* e latere caulis juxta foliorum par, interjecto sæpe ramulo 2—6-fasciculati: pedicelli basi connati, inæquales, 4—8 lineas longi. *Calyx* sub flore campanulatus, sub fructu pateriformis, membranaceus, truncatus, margine integerrimo. *Corolla* calyce duplo major, crassiuscula, alba (?), laciniis lanceolatis glabris. *Bacca* globosa, vix pisi minoris volumine, lævis, rubra, bi-locularis.

10. *Solanum crassipetalum.* Wall. Catal. n. 2618.

S. fruticosum, foliis inferioribus solitariis, superioribus geminis ovato-oblongis utrinque acuminatis ciliatis supra hirtis, altero minori, floribus

fasciculato-aggregatis laterifoliis, calyce subdecemdentato pedicellisque hirtis, dentibus subulatis alternis brevioribus.

Solanum crassipetalum. *Wall. in Roxb. Fl. Ind. Or.* ii. *p.* 256. *n.* 18.

Solanum denticulatum, var. *α*. *Blume, Bydr. p.* 697?

Solanum biflorum. *Don, Fl. Nepal. p.* 96. excl. plurib. synon.

Solanum biflorum. *Lour. Fl. Cochinch.* i. *p.* 159? *R. et Sch.* l. c. *p.* 610.

Habitat in Nepalia (*Wallich*).

Adnot. Solanum Blumii et *Solanum parasiticum,* Blum., huic atque præcedenti simillima, differunt calyce truncato, omnino edentulo.

11. *Solanum decemfidum.* Roxb., Wall. Catal. n. 2614.

S. herbaceum, erectum, perenne, foliis inferioribus solitariis superioribus geminis ovatis utrinque acutis hirtulis altero minore, floribus fasciculato-aggregatis laterifoliis, calyce decemdentato pedicellisque glabriusculis, dentibus lineari-subulatis æqualibus.

Solanum decemdentatum. *Roxb. Fl. Ind. Or. p.* 247. *n.* 5. *Wall. Catal.* l. c.

Habitat in China (*Roxb.* l. c.); ad Singapore (*Wall.*).

Adnot. Præcedenti simillimum. *Solanum decemdentatum,* Roxb., in Horto Calcuttensi e seminibus Chinensibus natum, non vidi; quod ante oculos est exemplum Herbarii Wallichiani, ad Singapore lectum, respondet notæ Wallichianæ, in *Fl. Ind. Or. p.* 247. impressæ. Verba Roxburghii propius ad *Solanum crassipetalum* accedere videntur, et in eo solummodo repugnant, quod annuum caulem declarant, qui fruticosus in hoc est. Synonymum *Solani biflori,* Lour., ad *S. crassipetalum* referre non dubitavi, quod idem et *Solani decemdentati* descriptioni Roxburghianæ, extra durationem, convenit.

12. *Solanum macrodon.* Wall. Catal. n. 2621.

S. fruticosum, erectum, foliis inferioribus solitariis superioribus geminis oblongo-lanceolatis utrinque acuminatis integerrimis supra ramulisque hirtis, altero duplo triplove minori, floribus solitariis fasciculatisve foliis interpositis, calycibus sulcatis decemdentatis dentibus subulatis fructu longioribus.

Solanum macrodon. *Wall. Catal.* l. c. *F. D.*

Ad Pundua lectum est.

Simile *Solano denticulato* (quoad habitum), a quo differt dentibus calycis longissimis; quoad calycis indolem *Solano lysimachioidi* conforme, sed differt caule lignoso, foliis longis et angustis, pedunculis plerumque fasciculatis, calyce sulcato.

13. *Solanum lysimachioides.* Wall. Catal. n. 2609.

S. herbaceum, caule basi repente apice ramisque adscendentibus, foliis plerisque geminis subæqualibus ovatis utrinque acutis integerrimis pubescentibus, floribus solitariis foliis interpositis glabriusculis, calycibus 8—10-dentatis, dentibus subulatis fructum æquantibus.

Solanum lysimachioides. *Wall. in Roxb. Fl. Ind. Or.* ii. *p.* 257. *n.* 19. (excl. synon. *Sol. biflori,* Lour.). *Catal.* l. c.

In montosis Sheopore, Chundra-giri et prope Chitlong legit Wallich. Floret tempore pluviarum; fructum Januario et Februario mensibus maturat.

Baccæ coccineæ. *Corolla* alba. Habitus plantæ fere *Lysimachiæ nemorum.*

Species hujus Sectionis (n. 5—13.) additis aliis, a cl. Blumio descriptis, summa omnium partium similitudine tam intime connectuntur, ut non nisi maxima cura adhibita distinguas. Habent tamen pleræque saltem earum certos suos characteres, quos neque in formis quasi intermediis mixtos aut vacillantes invenies, neque facile intelligas, qui fieri possit, ut unus in alterum transmutetur. Quæ ad magis sub oculos cadunt, hunc addimus harum specierum *Conspectum.*

A. *Characteres generales*: Caulis dichotomus, sæpe divaricatus, inferne compressiusculus aut teres; rami magis minusve angulati flexuosi. Folia inferiora solitaria, superiora geminata, rarius omnia solitaria, ovata—oblonga—oblongo-lanceolata, basi, pleraque et apice, attenuata, flaccidula, inæqualia; alterum scil. sæpe duplo minus, conforme, vel formæ diversæ. Flores ad alterum latus fasciculi foliorum rejecti, (cujus rei originem et rationem alio loco pluribus explicaturus sum,) solitarii, gemini, vel plures, in pedunculi communis noduliformis rudimento fasciculati, pedicellati; (in *Solano membranaceo* magis axillares). Calyx vel campanulatus vel cyathiformis, sub fructu pateriformis vel explanatus. Corolla rotata, profunde quinquepartita, laciniis oblongis

aut lanceolatis. Bacca parva, vel mediocris, globosa, calyci persistenti membranaceo, tanquam patellæ, imposita.

B. *Characteres distinctivi:*

1. Calycis limbus integerrimus, truncatus.

1. *Solanum parasiticum,* Blume (*Bydr. p.* 697.). Caulis nodosus. Folia omnia solitaria, glabra.
2. *Solanum Neesianum,* Wall. Folia geminata conformia, supra setulis minutissimis confertissimis scabra.
3. *Solanum Blumii,* N. ab E. (*Blume, Bydr. p.* 696.). Folia geminata difformia, minori ovato, supra setulis dissitis hirta; caulis violaceus; flores plures in fasciculo.
4. *Solanum bigeminatum,* N. ab E. Folia geminata conformia, supra setulis conicis dissitis hirta; flores subgemini vel solitarii.

2. Calycis limbus truncatus, decemdenticulatus, denticulis submarginalibus noduliformibus.

5. *Solanum denticulatum,* Blume. Vid. supra.

3. Calycis limbus octo- vel decemdentatus, dentibus plerumque subulatis.

a. Caulis herbaceus.

6. *Solanum lysimachioides,* Wall. Caulis basi repens; folia subæqualia, ovata, pubescentia; flores solitarii; calyx octo-decemdentatus.
7. *Solanum decemfidum,* Roxb. Caulis erectus; folia inæqualia, ovata, supra setulis dissitis hirta; flores fasciculati, decemfidi.

b. Caulis fruticulosus. (Folia omnium supra setulis hirta.)

8. *Solanum macrodon,* Roxb. Flores foliis sæpe interjecti, pauci vel solitarii; calycis dentes tubo fructuque longiores; folia oblongo-lanceolata, conformia, subtus glabra.
9. *Solanum mollissimum,* Blume (*Bydr. p.* 698.). Flores fasciculati, laterifolii; dentes calycis tubo æquales; folia difformia, subtus tomentosa, altero oblongo altero ovato.
10. *Solanum crassipetalum,* Wall. Flores fasciculati, laterifolii, pedicellis calycibusque hirtis; dentes calycis alterni breviores; petala crassiuscula; folia conformia, subovata, glabra vel subpubescentia.

4. Calycis limbus quinquedentatus. (Flores axillares.)

11. *Solanum membranaceum,* Wall. Flores subgemini, axillares; folia supra setulosa.

12. *Solanum læve,* Dun. Flores subgemini, axillares; folia glabra.

Sect. 3. *Verbascifolia, corymbiflora.*

14. *Solanum verbascifolium.* Linn., Wall. Catal. n. 2616.

S. fruticosum, foliis ovato-oblongis acuminatis integerrimis tomentosis, paginis discoloribus, axillis aphyllis, corymbis subterminalibus dichotomis pedunculatis, calycibus semiquinquefidis.

Solanum verbascifolium. *Linn. Sp. Pl.* i. *p.* 184. *R. Br. Prodr. Fl. Nov. Holl.* i. *p.* 444. *Dun. Sol. p.* 165. *n.* 61. *Jacq. H. Vindob.* i. *t.* 13. *R. et Sch. S. V.* iv. *p.* 598. *n.* 94.

Solanum pubescens. *Roxb. Fl. Ind. Or.* ii. *p.* 244. *n.* 1. *cum nota Wallichii. Blume, Bydr. p.* 698.

Solanum erianthum. *Don, Fl. Nepal. p.* 96. *n.* 2.

Solanum adulterinum. *Hamilt. Herb.*

Crescit in convallibus et ad latera montium demissorum Nepaliæ, in montibus regionis septentrionalis et occidentalis Hindustaniæ, et in Shreenugur (*Wall.* l. c.). Vidi exempla Herb. Roxb. (*Wall. Catal.* A.), Horti Bot. Calcuttensi (*Wall.* l. c. B.), e Nepalia (*Wall.* l. c. C.), e Sirmore et Kamoon (*Wall.* l. c. D. R. B.), ex Oude (*Wall.* l. c. E.), e Silhet, *F. D.* (*Wall.* l. c. F.), ex Herb. Russelliano, nomine *S. verbascifolii* (*Wall.* l. c. G.), ex Herb. Hamiltoniano, nomine *S. adulterini,* ad Gualpara et Nathpur lecta (*Wall.* l. c. H.), ex Herb. Wightiano, *Solani verbascifolii* nomine (*Wall.* l. c. F.), et Heyneano (*Wall.* l. c. K.); e Rangoon in Pegu 1826 (*Wall.* l. c. L.), e Prome et Segaen ripæ Irawaddi 1826 (*Wall.* l. c. M.), e Martabania 1827 (*Wall.* l. c. N.), ex Herb. Madr. (*Wall.* l. c. O.).

Variat foliis paullo latioribus, magis ovatis minusque tomentosis, quod *S. adulterinum* Herb. Hamilt., supra citatum.

15. *Solanum auriculatum.* Ait., Wall. Catal. n. 2617. A.—D.

S. fruticosum, foliis ovato-oblongis acuminatis integerrimis tomentosis

paginis subconcoloribus, axillis foliolis obliquis auctis, corymbis subterminalibus dichotomis pedunculatis, calycibus semiquinquefidis.

Solanum auriculatum. *Ait. Hort. Kew.* i. *p.* 246. *R. et Sch.* l. c. *p.* 599. *Dun.* l. c. *p.* 166. *Wall. in Roxb. Fl. Ind. Or.* ii. *p.* 245. *n.* 2.

Crescit sponte in insulis Mascarenis. Vidi exempla ex insula Mauritii, ex Hort. Bot. Calcutt. et ex Herbariis Hamilt. et Roxb.

Variat foliis gemmarum axillarum non magis, atque in aliis evolutis, et tum quidem hanc speciem a *Solano verbascifolio* vix nisi corollis cœruleis, quæ in hoc albo colore sunt, foliisque supra et subtus magis candicantibus subconcoloribus distingues.

16. *Solanum giganteum.* Jacq.

S. fruticosum, aculeatum, aculeis basi tomentosis, caule foliisque oblongo-lanceolatis utrinque acuminatis integerrimis inermibus subtus cymisque lateralibus dichotomis multifloris albo-tomentosis.

Solanum giganteum. *Jacq. Coll.* iv. *p.* 125. *Icon. Rar.* ii. *t.* 328. *Dun. Sol. p.* 202. *n.* 144. *Willd. Sp. Pl.* i. 2. *p.* 1046. *R. et Sch.* l. c. *p.* 633.

Solanum niveum. *Thunb. Fl. Cap.* i. *p.* 189.

Solanum farinosum. *Wall. in Roxb. Fl. Ind. Or.* ii. *p.* 255. *Wall. Catal. n.* 2610, A.

Solanum argenteum. *Heyn. Herb.*

?β. caule inermi (?), foliis tenuioribus longius petiolatis, tomento partium tenuiori, magis incano, calycibus profundius divisis:

Solanum farinosum. *Herb. Wight.*, *Wall. Catal. n.* 2610, b.

? γ. Folium unum, fere pedale, 4 pollicum latitudine, forma tomentoque var. β. simile:

Solanum farinosum. *Wall. Catal. n.* 2610, C.

Habitat α. ad Caput Bonæ Spei. β. a Wightio in Dindygul, ped. 2000 alt. lectum est; γ. a cl. Noton e Nilghiry relatum est.

Obs. Forma prima differre nobis videtur a binis sequentibus. Hæc autem, non nisi in Herb. Heyneano reperta, fortasse in Capite B. Sp. lecta est. Var. β. diversa species, eaque vero Indicæ originis esse videtur; sed sola summitas ad manus est, fructibus, nec floribus prædita; foliumque (Notonianum) giganteum. Velim itaque, ut a clarissimo Wallichio ipso exempla Wightiana reli-

qua examinentur, quibus solis res ad lucidum denique perduci potest. Si caulis inermis sit, vel subinermis, solum restabit *Solanum subinerme* Jacquini, a quo nostrum cautius sit distinguendum. In nostro exemplo baccæ nigræ videbantur, quæ luteæ in *S. giganteo.*

Adnot. In specimine, a cl. Wightio nuper transmisso, caulis apicem versus armatus est aculeis latissimis, triangularibus, lateribus fere æqualibus vel basi paulo latiori, ibidemque tomentosis. Reliqua ut in exemplis ex eodem herbario ante hæc traditis. Habet sane ista forma aliquid peculiare, sed speciem esse propriam nondum persuasum est. Differentia etenim ad primum adspectum magis quam post accuratam inspectionem apparet. Folia sunt magis membranacea, tenuiora tomentoque paginæ inferioris subtiliori et pulverulento albidoque vestita; aculei latiores, sed ejusdem tamen formæ ut in communi specie; inflorescentia est paulo gracilior et candida;—plura gravioraque, quibus distinguatur, non video.

17. *Solanum vagum.* Heyn., Wall. Catal. n. 2624.

S. fruticosum, inerme, foliis ovato-oblongis repando-sinuatis, junioribus subtus ramulisque novellis pulverulento-tomentosis, cymis lateralibus bifidis, calycis laciniis longe acuminatis, baccis parvis globosis.

Solanum vagum. *Herb. Heyn., Wall.* l. c.

Solanum corymbosum? *Herb. Wight.*

Species bene distincta ab affinibus *Solano longifolio* Dun., et *S. bombensi* Jacq. seu *pubigero* Dun. foliis semper repando-angulatis; a priori etiam flore minore albo, a posterioribus calycis laciniis longis acuminatis.

Sect. 4. *Melongena.* (Calyx grossificatus, corolla angulato-5fida).

18. *Solanum Melongena.* Wall. Catal. n. 2628.

S. herbaceum, basi lignescens, perenne, caule foliisque ovatis basi inæqualibus sinuato-angulatis stellato-tomentosis, pedunculis florentibus reflexis fertilibus subsolitariis, calyce campanulato in fructu grossificato laciniis lineari-lanceolatis, corolla angulata.

A. Pedunculo fertili solitario, adjecto sæpe racemulo florum sterilium;

α. caule, foliis calycibusque inermibus subinermibusve.

Solanum ovigerum. *Dun. Sol. p.* 210. *R. et Sch.* l. c. *p.* 639. *n.* 240. *Blume, Bydr. p.* 698.

Solanum Melongena. *Linn. Syst. Veg.* i. *p.* 188. *Willd. Sp. Pl.* i. 2. *p.* 1036. *n.* 41. *Roxb. Fl .Ind.* ii. *p.* 248. *n.* 7. *Lour. Fl. Cochinch.* i. *p.* 161. *n.* 7.

Solanum pseudo-undatum. *Blume, Bydr. p.* 699.

Solanum pubescens. *Herb. Madr., Wall.* l. c. G. (ex N. ab E.).

β. caule, foliis calycibusque magis minusve aculeatis:

Solanum esculentum. *Dun. Sol. p.* 248. *R. et Sch.* l. c. *p.* 638.

Solanum Melongena. *Linn. Suppl.* i. *p.* 266. *Roxb.* l. c. ex parte. *Plenck, Pl. Off. tab.* 123. *Lour. Fl. Cochinch.* l. c. ex parte.

Solanum insanum. *Linn. Mant. p.* 46. *Willd.* l. c. *p.* 1037. *n.* 45.

Nila-Barudena. *Rheede, Hort. Malab.* x. *p.* 147. *t.* 74. *Pluken. Alm. p.* 550. *tab.* 220. *f.* 3.

Quoad fructus variat quæque harum varietatum:

1. fructu ovato-oblongo vel oblongo, violaceo, (*Trong Mera* Rumph.);
2. ———————————, albo, (*Trong Puti* Rumph.);

Hujus loci *Sol. Melongena α.* et *Sol. ovigerum* Dun. et Bl.

3. fructu subgloboso violaceo, majori et minori;
4. ——————— albo, (*Trong Tamatte* Rumph.);
5. ——————— violaceo vittato;

Hujus loci *Sol. pseudo-undatum* Bl. *Chunda,* Rheede, *Hort. Malab.* ii. *p.* 69. *tab.* 37.

B. Pedunculo fertili racemoso-corymboso tri-quadrifloro, caule foliis calycibusque aculeatis, fructu minore ovato vel subgloboso, in quibusdam calyce incluso.

Solanum Melongena spontaneum vel incultum.

Solanum insanum. *Roxb. Fl. Ind.* ii. *p.* 249. *n.* 9. (excl. synon. Rumphii, v. *t.* 86. *f.* 1.)

Solanum undatum. *Lam. Enc. Meth.* iv. *p.* 301. *Blume, Bydr. p.* 700.

Solanum incanum. *Linn. Sp. Pl.* i. *p.* 188. *Dun. Sol. p.* 213. *R. et Sch.* l. c. *p.* 641.

Solanum zeylanicum. *Scop. Del.* i. *tab.* 1.

Solanum indicum. *Wall. Catal. n.* 2626, G. ex *Herb. Heyn.* (ad partem).

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Habitat in India Orientali, maxime culta. Var. A. α. (*ovigerum*) vidi ex Hort. Bot. Calcuttensi, ex Herbb. Heyneano, Wightiano apud Wallichium et proprio, et Hamiltoniano (e Balahat, Kumargunj et Patna); varietatem A. β. (*esculentum*) omni fructuum diversitate exhibet Herb. Hamiltonianum e Bar, Bhadurgunj, Balahat et Parrauna; porro e Silhet (*F. De Silva*) et ex Herb. Heyneano Hortoque Calcuttensi, unde specimen aculeis gracillimis, hinc inde fasciculatis geminis ternisque, quod nobis var. β*. Var. β. e Silhet (*F. De Silva*), et e Balahat, Chinsura et Patna (*Herb. Hamilt.*). Var. A. α. ex Herb. Madr., Wall. Catal. Suppl. n. 234. et 236. (*Solanum pubescens*, Herb. Madr.). Var. A. β. specimen aculeis gracillimis, hinc inde fasciculatis geminis ternisque, ex Hort. Bot. Calcutt., Wall. l. c. n. 249., quæ nobis var. β*.; var. A. β. ex Herb. Wight. Var. A. β*. foliis plerisque triangulari-attenuatis acuminatis aliis autem ovatis obtusiusculis integris vel subrepandis; caulis fuscus; bacca magnitudine baccæ *Sol. tuberosi*, globosa. Legit ad Taong Dong, d. 7 Jan. 1827, Guil. Gomez, Wall. l. c. n. 273; Var. β. in Taong Dong, Nov. 1826, (*Guil. Gomez*, nomine *Sol. indici*,) Wall. l. c. n. 272., ex Herb. Madr. (*Sol. indicum*), Wall. l. c. n. 229., Herb. Madr. (*Sol. insanum*, ad partem), Herb. Wight.

Species vexata hortorum, præsertim Europæorum, injuriis, duratione male intellecta, plantisque spontaneis vel efferatis cultisque divulsis †.

Calyce in fructu amplificato laciniis longis et angustis prædito, flore (*Solani tuberosi*) amplo plerumque violaceo, fructuque grandi vel saltem grandiusculo, glabro, sulcato vel lævi, dignoscitur. Folia basi inæqualia, magis minusve cuneata, obtusiuscula, angulis utrinque 2—4 obtusis sinubus amplis discretis instructa, tomentosa, supra incana, subtus albida densiusque vestita. Pedunculi sub anthesi reflexi, apice incrassati, plerisque solitarii, supra quos racemulus prodit abortiens. Fructus bi-trilocularis, trophospermiis lamina centrali stipitatis.

Caulis, ubi planta inter tropicos neglecta vagatur, sæpe totus lignescit duratque, pluribus aculeis et validioribus obsitus est graciliorque. Folia tum quoque aculeis horrent et calyces; pedunculus communis plures sæpe profert flores

† *Solanum Trongum* et *pressum* Dun. et *Sol. album* Lour. hujus meræ varietates videntur, ex hortis aufugæ.

fœcundos, et solitarius ille pedicellus cultarum, qui inferior est racemi abortientis et eam ob causam e ramo vel caule gigni videtur, una cum reliquis a communi pedunculo attolitur; simul fructus magnitudo diminuitur.

19. *Solanum heteracanthum.* Dun.

S. herbaceum, basi lignescens, perenne, stellato-hirtum, caulis angulati aculeis crassis reduncis, foliis ovalibus sinuatis subtus incanis utrinque valide aculeatis aculeis rectis, laciniis angulatis, pedunculis corymbosis multifloris masculis; cum flore basali fertili, calyce in fructu parum grossificato, corollæ quinquefidæ laciniis oblongo-lanceolatis.

Solanum heteracanthum. *Dun. Synops. p.* 39. *n.* 239. *Poir. Enc. Meth., Suppl.* iii. *p.* 773. *R. et Sch. S. V.* iv. *p.* 640. *n.* 243.—Solanum indicum Hort. Bot. Calcutt. *Wall. Catal. Suppl.*

Colitur in Hort. Bot. Calcutt.

Solano Melongenæ var. B. persimile, sed differt non solum aculeis validissimis recurvis per intervalla in caule confertioribus, sed etiam foliis profundius sinuatis lobis utrinque angulatis, maximeque corolla ultra medium quinquefida.

Sect. 5. *Torva*, (aculeata, foliis lobatis, floribus corymbosis laterifoliis quinquefidis.)

A. Baccis calyce tectis vel hirsutis.

20. *Solanum Wightii.* N. ab E.

S. fasciculato-hirsutum, caule (suffruticoso?) tereti aculeis acicularibus armato, foliis solitariis subcordato-ovatis ellipticisve sinuatis acutis subaculeatis, fasciculis paucifloris, pedunculis fructus elongatis, baccis glabris globosis calyce inermi hirsuto tectis.

Solanum Wightii. *N. ab E. Wall. Catal. Suppl. Herb. Wight. propr. n.* 126.

Patria ..... An Indiæ Orientali indigena?

Differt a duobus sequentibus pedicellis fructus et laciniis calycis maxime elongatis, neque aciculatis, sed fasciculato-hirsutis. His characteribus, cum fructu tecto conjunctis, etiam ab omnibus reliquis Solanis, quæ vidi, discedit.

21. *Solanum barbisetum.* N. ab E.

S. fasciculato-hirsutum, caule herbaceo aculeato aculeis rectis, foliis gemi-

nis ellipticis sinuatis utrinque hirsutissimis aculeatisque, laciniis angulatis, racemis lateralibus simplicibus multifloris secundis aculeatis, baccis glabris calyce aciculato-setoso tectis.

Solanum barbisetum. *N. ab E. Wall. Catal. Suppl.*

Solanum Melongena. *Wall. Catal. n.* 2628, e. (ad partem).

Crescit in Silhet (*F. De Silva*), in ripa Attran fluvii in Martabania 1827; in Tavoy lectum a Guil. Gomez cum floribus Aprili, florensque et fructu fere maturo Augusto 1827. ⊙?

Species *Solani aculeatissimi* habitu, sed distinctu facilis ob inflorescentiam racemosam et fructum calyce velatum, (quæ nota sola, neque ulla alia, ad *Solanum tectum* Poir. accedit).

22. *Solanum ferox.* Linn. (Wall. Catal. n. 2623, E. &c.)

S. caule perennante herbaceo basi lignescente foliisque geminis cordatis sinuato-angulatis utrinque tomentoso-lanuginosis aculeatisque, pedunculis intrafoliaceis pedicellisque abbreviatis, calycibus baccisque hirsutis.

Solanum ferox. *Linn. Sp. Pl.* i. *p.* 267. *Willd. Sp. Pl.* i. 2. *p.* 1039. *R. et Sch.* l. c. *p.* 648. *Dun.* l. c. *p.* 223. *Herb. Wight., Wall. Catal. n.* 2623, E.

Solanum involucratum. *Blume, Bydr. p.* 701.

Solanum lasiocarpum. *Dun. Sol. p.* 222. *n.* 173. *R. et Sch.* l. c. *p.* 648. *Blume, Bydr. p.* 701. *Wall. in Roxb. Fl. Ind.* ii. *p.* 255. *Obss. Catal. n.* 2623, A—F.

Solanum hirsutum. *Roxb. Fl. Ind.* ii. *p.* 253. *n.* 14.

Solanum mammosum. *Lour. Fl. Cochinch.* i. *p.* 162. *n.* 10. (falso ad *Solanum stramonifolium* relatum).

Solanum indicum frutescens maximum villosum totum, fructibus croceis. *Burm. Zeyl. p.* 218. *Fl. Ind. p.* 56.

Solanum pomiferum indicum, fructu rotundo hirsuto, foliis utrinque spinosis et hirsutis, flore albo. *Moris. Hist.* iii. *p.* 525. *n.* 12. *sect.* 13. *tab.* 2. *fig.* 12. (optima!).

Ana Chunda. *Rheede, Hort. Malab.* ii. *p.* 65. *tab.* 35.

β. flavescens. Solanum flavescens, *Dun.* (E Prome. *Wall. Catal. Suppl. n.* 270, bis.)

Crescit in locis uliginosis regni Siam, Herb. Finlayson. (*Sol. lasiocarpum*), Wall. Catal. Suppl. n. 218.; a Taong Dong prope Avam 1826, Wall. l. c. n. 270.; colitur ad ripas fl. Saluen 1827, Wall. Catal. l. c.; Tavoy (*Guil. Gomez*), Wall. l. c.; ex Hort. Bot. Calcutt. (*Sol. hirsutum*), Wall. l. c. n. 262.; ex Herb. Madr. nomine *Solani* sp., *villosum* nobis, Wall. l. c. n. 262., Herb. Wight. varr. majus et minus; circa Calcuttam (*Roxb.* l. c.). Vidi exempla in Silhet, Penang et Singapore lecta; porro e Nobari allata in Herb. Hamiltoniano, et alterum, nomine *Solani ferocis* inscriptum, in Herb. Wightiano. In Cochinchina Loureiro legit, in Java Blumius, cujus exemplum ipse examinavi. Ex Herb. Calcuttensi cultum vidi.

Variat calycibus et pedunculis magis minusve aculeatis, aculeolis parvis, subulatis, sub hirsutie quandoque latentibus. Duratione diversum perhibet Dunalius *Solanum lasiocarpum* a *Sol. feroce*, quod minime verum.

B. Baccis calyce denudatis glabris.

23. *Solanum torvum.* Sw.

S. caule fruticoso aculeato, aculeis subrecurvis basi tomentosis, foliis geminatis ovatis cordatisve acutis sinuatis angulatisve tomentoso-hirtulis subaculeatis, altero minore, pedunculis extrafoliaceis corymbosis multifloris calycibusque inermibus, laciniis calycis lanceolatis acutis, corolla quinquefida, baccis globosis.

Variat foliis modo in eodem caule apicem versus, modo in diversis plantis amplioribus cordatis profunde sinuatis, laciniis acutis, vel minoribus basi ovata valde inæquali, ambitu obtuse repando-lobato.

Solanum torvum. *Sw. Prodr. Fl. Ind. Occ. p.* 47. *Fl. Ind. Occ.* i. *p.* 456. *Willd. Sp. Pl.* i. 1. *p.* 1038. *n.* 46. *Dun. Sol. p.* 203. *n.* 145. *tab.* 23. *R. et Sch.* l. c. *p.* 634. *Herb. Hamilt.* ex *Hort. Calcutt.*

Solanum stramonifolium. *Lam. Illustr. Gen. n.* 2365. *Poir. Enc. Meth.* iv. *p.* 300. *n.* 60. (excl. synon. *Sol. stramonifolii* Jacq.). *Roxb. Fl. Ind.* ii. *p.* 256. *n.* 17. *Wall. Catal. n.* 2627. *Herbb. Wight. et Heyn.*

Solanum ferrugineum. *Jacq. Hort. Schœnbr.* iii. *p.* 46. *tab.* 334. *Willd. Enum.* i. *p.* 239. *Dun. Syn. p.* 36. *n.* 220. *R. et Sch. S. V.* iv. *p.* 634. *n.* 224.

Solanum ficifolium. *Orteg. Dec.* ix. *p.* 116. *Cavan. Descr. p.* 113.

Solanum scabrum. *Ruiz et Pav. Fl. Per.* ii. *p.* 39. *tab.* 175. *f.* a. *Poir. Synops.* i. *p.* 229. *n.* 130.

Solanum saponaceum. *Dun. Solan. p.* 206. *Synops. p.* 37. *n.* 230. *Poir. Enc. Meth., Suppl.* iii. *p.* 773. *R. et Sch. S. V.* iv. *p.* 637. *n.* 234.

Solanum pseudo-saponaceum. *Blume, Bydr. p.* 702.

β. inerme, foliis levite rrepandis. Ex Herb. Madr. *Wall. Catal. Suppl. n.* 242, bis. Ex Hort. Bot. Calcutt. *Wall.* l. c. *n.* 255.

Solanum Silarium. *Herb. Hamilt., Wall. Catal. n.* 2627, D.

Solanum multiflorum. *Roth, Nov. Pl. Sp. p.* 130. *R. et Sch. S. V.* iv. *p.* 669. (var., seu pars caulis, foliis obiter et obtuse lobatis).

Habitat in Bengalia frequens, circa domos et tuguria, florens fructificansque omni anni tempore. Vidi exempla e Bengalia, e Penang, ex Herbb. Heyneano, Wightiano, et Finlaysoniano (*Wall. Catal. Suppl. n.* 212.). Porro notatur ex Herbario Hamiltoniano *Solani torvi*? nomine, cultum in Horto Botanico Calcuttensi, et *Solani Silarii* nomine in Nathpur lectum, ex Herb. Hamiltoniano.—In sepibus Jamaicæ, Hispaniolæ, insularum Bermudensium (*Swartz.*).

Modo crescendi et forma foliorum proximum *Solano lasiocarpo* Dun., a quo tomento partium tenui, calyce parvo inermi et fructu globoso glabro longe distat. Descriptio Rothiana, si folia addis formæ alterius, bona, nec Swartzii *Solani torvi* descriptio contemnenda, tametsi dubia quædam videantur.

Adnot. 1. Vereor, ne diversæ species sub hoc uno *Solani torvi* Sw. nomine lateant, quarum una, Indiæ Occidentali indigena, eadem fortasse ac *Sol. indicum* Linn., altera, Indiæ Orientalis civis, a cl. Rothio *Sol. multiflori* nomine nunc primum distincta est.

Adnot. 2. *Solanum indicum* Linn. Herb. et Sp. Pl. ed. i. p. 187. a cl. Swartzio ad hoc *Sol. torvum* adducitur, nescio qua fide, cum a cl. Wallichio *Sol. indicum* Herb. Linn. in Catalogo ad nostrum *Sol. indicum,* quod *Sol. violaceum* Jacq. referatur.

Adnot. 3. *Solanum stramonifolium* Jacq. Misc. ii. p. 298. Ic. Rar. i. tab. 44., idemque ex India Occidentali allatum, a *Solano torvo* nostro differt foliis magis aculeatis, calycis laciniis brevissimis rotundatis et corollis violaceis.

Adnot. 4. Exemplum quoddam speciei hujus generis a cl. Blumio quondam e Java insula ad me transmissum, haud male cum varietate minore *Solani torvi* convenit, sed omnino caret aculeis. Quod nisi obstaret, *Solanum pseudo-saponaceum* hujus auctoris (*Bydr.* p. 702.) esse nobis persuaderemur.

24. *Solanum indicum.* Linn. Herb. (Wall. Catal. n. 2626, partim.)

S. fruticosum, aculeatum, aculeis caulinis compressis recurvis, foliis solitariis geminisve ovatis sinuato-lobatis pinnatifidisve basi inæqualibus tomentosis discoloribus, racemis interfoliaceis subcymosis, calycis aculeati laciniis rectis, baccis globosis, corolla quinquefida.—Variat:

α. Foliis basi cuneiformibus truncatisve sinuato-lobatis:

Solanum indicum. *Linn. Fl. Zeyl. p.* 94. *Burm. Thes. Zeyl. p.* 220. *tab.* 102. *Lour. Fl. Cochinch.* i. *p.* 162. *n.* 11. *Roxb. Fl. Ind.* ii. *p.* 252. *n.* 13. *Herb. Madr.* (ad partem), *Wall. Catal. n.* 2626, A. B. D. F. H. I. *Suppl. n.* 239.

Solanum violaceum. *Jacq. Fragm. p.* 82. *tab.* 133. *f.* 1. *R. et Sch.* l. c. *Dun.* l. c. *p.* 128. *Herb. Hamilt.*

Solanum canescens. *Blume, Bydr. p.* 701.

Solanum sodomeum. *Herb. Russell.*

Cheru-Chunda. *Rheede, Hort. Malab.* ii. *tab.* 36.

β. Foliis basi truncatis cuneatisve eroso-pinnatifidis:

Solanum pinnatifidum. *Roth, Nov. Pl. Sp. p.* 129.

Solanum Heynei. *R. et Sch. S. V.* iv. *p.* 669. *Spr. S. V.* i. *p.* 688. *n.* 160.

Solanum indicum. *Wall. Catal. n.* 2626, D. E.

γ. Foliis (minoribus) basi cordatis sinuato-lobatis:

Solanum agreste. *Roth, Nov. Pl. Sp. p.* 130. *R. et Sch. S. V.* iv. p. 668.

Solanum indicum. *Wall. Catal. n.* 2626, G. (ex parte), *Suppl. n.* 240.

δ. Foliis minoribus basi truncatis subcordatisve, leviter repando-angulatis, caule parcius aculeato, racemis sæpe depauperatis 1—4-floris.

Solanum pubescens. *Herb. Heyn.* (ex parte), *Wall. Catal. n.* 2629, A. (ex parte).

Vulgaris pluribus Indiæ plagis. Vidi exempla var. α. e Silhet (*F. De Silva*); ex Oude, e Srinagur (*Kamroop*); e Penang; ex Herbb. Wightiano, Heyneano, Hamiltoniano et Russelliano: var. β. e Penang et e Bengalia in-

feriore, ex Herb. Madr., Wall. Catal. Suppl. n. 239; in Tavoy (*Guil. Gomez*), Wall. Catal. Suppl. n. 272.: varr. γ. δ. ex Herb. Heyneano.

Hæ formæ omnes, pro solo situque variæ, notis specificis optime congruunt, nec facile cum aliis confundi possunt.

Adnot. 1. *Solanum indicum* Herb. Linn. esse hanc, quam exposuimus speciem, Catalogo Wallichiano edoctus sum. Retinui itaque *Solani indici* nomen, tametsi Linnæus cum orientali hac planta aliam occidentalem, longe diversissimam, nescio quo tempore, confuderit. Linnæus, cum anno 1737 *Hortum Cliffortianum* ederet, Dillenii *Hortum Elthamensem* a. 1732 editum, magis quam Burmanni *Thesaurum Zeylanicum*, eodem, quo *Hortus Cliffortianus* impressus est anno, in lucem emissum, consuluisse videtur, cujus, quæ hodie dum citari solet Tabula 270. e Roberti fasciculis mutuata, *Sol. indicum* Dunalii, in insula Barbadoes sponte crescens, idemque variis nominibus venditatum, exhibet. Hocce igitur haud immerito *Sol. indicum* Linnæi appellares, nisi Herbarium monstraret orientalem hanc nostram plantam, quam fortasse eodem tempore e thesauris Zeylanicis sibi traditam, post decem annos elapsos (1747) in *Flora Zeylanica*, citato Burmanno, vel americano illi *Solano* substituit, vel nova saltem certiorique auctoritate illustrare voluit. Et illustrasset sane, nisi Dillenii icone, in pristino loco *relicta*, ex altera parte majoribus adhuc erroribus ansam præbuisset.

Adnot. 2. *Solanum pinnatifidum* et *Sol. agreste* Rothii certo hanc ad speciem pertinent. Clarissimus Rothius in errorem ductus esse videtur: 1°. icone Dillenii, 2°. exemplo Herbarii Heyneani, quod, ut supra jam demonstravimus, *Sol. indici* nomine teneram quoddam *Sol. Melongenam*, var. γ., *Sol. undato* Lam. et Blumii omnino congruum, foliisque basi distincte cuneatis præditum, servat. Quibus explicantur verba cl. Rothii (l. c. p. 131.), differt (*Sol. agreste*) a *Sol. indico* "foliis cordatis, nec basi cuneatis; florum parvitate et structura."

Adnot. 3. *Solanum sanctum* Linn. a nostro solis aculeis differre videtur rectis, nec recurvis, sed et recurvos istos in nostris *Sol. sancti* invenimus exemplis, ut itaque hoc etiam *Sol. sanctum Sol. indico* adscribi posse persuasum sit.

25. *Solanum Jacquini.* Willd.

S. herbaceum, perenne, caule procumbente ramoso aculeato, foliis ovato-oblongis subcordatis sinuato-pinnatifidis utrinque (junioribus saltem)

stellato-hirtis aculeatisque margine nudis, laciniis acutis, racemis extrafoliaceis paucifloris calyceque campanulato quinquefido aculeatis, laciniis late ovatis cuspidulatis, in fructu patentibus.

α. Caule foliisque parcius aculeatis, ætate glabriusculis, aculeis gracilioribus, bacca majori pollicari:

Solanum diffusum. *Roxb. Fl. Ind.* ii. *p.* 250. *n.* 11. *Wall. Catal.* 2613, A.

Solanum xanthocarpum. *Schrad. et Wendl. Sert. Hanov.* i. *p.* 8. *tab.* 2. *Willd. Sp. Pl.* i. 2. *p.* 1041. *Dun. Sol. p.* 231. *R. et Sch.* l. c. *p.* 655.

β. Caule foliisque aculeis crassis validisque armatis, bacca minori semipollicari:

Solanum Jacquini. *Willd. Sp. Pl.* i. 2. *p.* 1041. *Dun.* l. c. *p.* 190. *R. et Sch.* l.c. *p.* 654. *Roxb. Fl. Ind.* ii. *p.* 251. *n.* 12. *Wall. Catal. n.* 2612, A. B. C. D.

Solanum virginianum. *Jacq. Ic. Rar.* ii. *tab.* 332. *Coll.* ii. *p.* 285.

Solanum virginianum. *Herb. Russell.*

Solanum diffusum. *Wall. Catal. n.* 2613, B. C. D.

Habitat ubique in Indiæ Orientalis cultis incultisque ad vias cet., et floret fructumque maturum profert omni anni tempore. Vidi exemplum varr. *α.* et *β.* ex Herbario Roxburghiano. Porro var. *β.* (*Jacquini*) ex Herb. Madr., Wall. Catal. Suppl. n. 241., et ex Hort. Bot. Calcutt., Wall. l. c. n. 261. e Silhet allatam ex Herb. Wightiano ad Trichinopala, et ex Herb. Hamiltoniano in Monghez (*Solani Jacquini* nomine), deinde ex Herb. Heyneano et Russelliano lectam (nomine *Solani virginiani*).

Adnot. 1. *Solanum diffusum* et *Sol. Jacquini* Roxb. Fl. Ind. vix varietatum nomine differunt, soloque aculeorum infirmiorum indole et fructus ampliori mole distinguuntur. Hæc autem per gradus sensim sensimque transeunt.

Variat cæterum hæc species, 1°. aculeis caulinis foliorumque et pedunculorum parcioribus, subulatis, in foliorum non nisi costa media observandis (*Sol. diffusum* Herb. Roxb.); iisdemque fortioribus confertis longis et crassis, conico-subulatis, foliorum costam et ramos primarios, petiolos, pedunculum communem et partiales calycesque occupantibus (*Sol. Jacquini*); 2°. petiolis modo folia æquantibus (ut in *Sol. Jacquini* Herb. Wight., Wall. Catal. n. 2613, C.), modo foliis brevioribus (ut in reliquis plerisque); 3°. foliorum laciniis modo latioribus repandis et sublobatis (ut in *Sol. diffuso* Herb. Roxb.), vel subtrilobis

(ut in *Sol. diffuso* Herb. Wight. supra citato, et in *Sol. Jacquini* Herb. Heyn. et Hort. Bot. Calcutt., Wall. Catal. n. 2612, D. et B.); modo angustioribus et utrinque angulo uno prominente prædititis (ut in *Sol. Jacquini* Herbb. Roxb. et Hamilt., Wall. Catal. n. 2612, A. et C., et in *Sol. diffuso Silletano* Wall. Catal. n. 2613, B.), vel sinuato-pinnatifidis (ut in *Sol. virginiano* Herb. Russell., Wall. Catal. n. 2613, D.); 4°. fructu magnitudine cerasi maximi vel grossulariæ, luteo, vel albo et albo viridique variegato.

Adnot. 2. Inquirendum, numne *Solanum sarmentosum* nostrum inter hujusce speciei varietates pertineat. Differre videtur a *Solano diffuso* Roxb. teneritate, aculeis caulinis recurvis, foliis subintegris, subciliatis, pedunculis unifloris, calyce et flore minore.

26. *Solanum procumbens.* Lour.

S. caule fruticoso procumbente aculeato aculeis recurvis, ætate glabro et inermi, foliis (parvis) geminis breve petiolatis ovatis obtusis repando-lobatis utrinque stellulato-tomentosulis glaucis in costa aculeatis, pedunculis lateralibus terminalibusque paucifloris, floribus reflexis quadrifidis tetrandris.

Solanum procumbens. *Lour. Fl. Cochinch. ed. Willd.* i. *p.* 163. *n.* 12. *Dun. Synops. p.* 38. *n.* 233. *Solan. p.* 207. *R. et Sch. S. V.* iv. *p.* 637. *n.* 237. *Wall. Catal., Suppl. n.* 214.

Crescit in Cochinchina inter sepes et in locis agrestibus (*Lour.*). E Hué, in Herb. Finlays. (*Wall.* l. c.).

Habitu accedit ad *Sol. trilobatum.* Flores non semper apice agglomerati ut habet Loureiro; omnes autem quos examinavi quadrifidi et tetrandri erant. Corolla parva, calyce duplo major, laciniis lanceolatis obtusis. Bacca pisi magnitudine lævissima.

27. *Solanum sarmentosum.*

S. herbaceum, caule procumbente sarmentoso aculeato, foliis geminato-suboppositis oblongis repando-sublobatis stellato-hirtis subaculeatis, pedunculis extrafoliaceis subunifloris calyceque turbinato quinquefido aculeatis, laciniis calycis subulatis.

Solanum Melongena, 2628? F. *Wall. Catal.*

E Penang allatum est a. 1822.

Foliis parum incisis et suboppositis cauleque sarmentoso herbaceo ab omnibus, quas vidi, speciebus differt. Parvum exoletumque *Solani diffusi* exemplum existimari possit, sed nimis differre videtur ab hoc calyce (*Melongenæ*), inflorescentia, foliis.

28. *Solanum trilobatum.* Linn.

S. caule frutescente scandente uncinato-aculeato, foliis panduriformi-trilobis trilobisve obtusis glabris petiolisque pedunculisque aculeatis, racemis subumbellatis terminalibus lateralibusque, corollis profunde quinquefidis.

Solanum trilobatum. *Linn. Sp. Pl.* i. *p.* 270. *Willd. Sp. Pl.* i. 2. *p.* 1049. *Dun. Sol. p.* 225. *R. et Sch.* l. c. *p.* 651. *Burm. Fl. Ind. p.* 57. *tab.* 22. *f.* 2. *Roxb. Fl. Ind.* ii. *p.* 253. *n.* 14. *Wall. Catal. n.* 2622. *Suppl. n.* 243. *Herb. Wight. propr.*

Solanum acetosæfolium. *Lam. Ill. Gen. n.* 2381. *Poir. Enc. Meth.* iv. *p.* 306. *Dun.* l.c. *p.* 226. *R. et Sch.* l.c. *p.* 652. *n.* 277. *Spr. S. V.* i. *p.* 689. *n.* 70.

Solanum fuscum. *Herb. Heyn., Wall. Catal. n.* 2622, B.

Solanum spinosum Jamaicense glabrum, foliis parvis minus profunde laciniatis. *Pluk. Alm. p.* 351. *Phytogr. tab.* 316. *fig.* 5.

Habitat ad marginem viarum in ora Coromandel, præcipue in Circulis septentrionalibus, aliis fruticibus longo tractu, ob laxitatem caulium, incumbens, omnique tempore anni flores fructusque proferens. Vidimus exempla Herbariorum Madr., Roxburghiani, Heyneani, Russelliani et Wightiani. In Jamaica nasci Plukenetius refert.

Adnot. Quæ Dunalius ad distinguendum *Solanum trilobatum* et *Sol. acetosæfolium* (dubius tamen et ipse) adfert, neutri eorum propria sunt. Indica nostra exempla aculeis fortibus in caule, petiolis, foliis, pedunculis calycibusque gaudent, floribusque amplis violaceis; racemi modo paucissimos flores, modo plures, perficiunt; merito itaque ne varietatum quidem nomine separantur. Quæritur autem, numne *Solanum* sic dictum Jamaicensi Plukenetii ex ista patria ortum sit, cum recentiores nullam ejusdem notionem fecerint, Burmannus autem Zeylanici illius certissimam, cui etiam Plukenetii icon examussim congruit. In Java insula, quam patriam *Sol. acetosæfolio* tribuunt, cl. Blumius non invenit.

Cognoscitur hæc species ab omnibus sui generis caule flagelliformi, anguloso, glabro, aculeis multis aduncis obsito.

Sect. 6. *Nycterium.*

29. *Solanum (Nycterium) pubescens.* Willd. Wall. Catal. n. 2629.

S. frutescens, inerme, totum pubescenti-hirtum, pubescentia stellari, foliis ovatis acutis integerrimis subrepandisve, racemis corymbosis laterifoliis, anthera infima productiore.

Solanum pubescens. *Willd. Phytogr. p.* 5. *n.* 17. *tab.* 3. *Sp. Pl.* i. *p.* 1026. *n.* 4. *R. et Sch. S. V.* iv. *p.* 601. *Dun. Sol. p.* 167. *Herb. Madr.* (ad partem) *Wall. Catal. n.* 2629. *Suppl. n.* 237.

Crescit in Indiæ Orientalis hortis et arboretis (*Willd.* l. c.). Equidem vidi in Herbario Heyneano (cum *Solano indico,* δ. commixta exempla) et in Herb. Wightiano.

Rara species esse videtur, cum viva neque a Roxburghio neque a Wallichio sit observata. Non ea autem similis *Solano verbascifolio* dicenda, sed potius maxime dissimilis, *Solanum hirsutum* Dun. magis quam *S. verbascifolium* referens.

Adnot. 1. Icon *Trongi agrestis albi* Rumph. Amboin. v. tab. 86. f. 2. non male cum nostra plantam convenire videtur ; sed descriptio aculeos in ramis et foliis inferioribus adesse docet, quorum nulla in icone vestigia reperiuntur.

Adnot. 2. *Solanum Vespertilio* Ait. Hort. Kew. i. p. 252., seu *Nycterium cordifolium* Vent. Malm. p. 85., nostro proximum, differt caule aculeato, foliis cordatis, floribus sæpe quadrifidis.

Sect. 7. *Pinnatifolia.*

30. *Solanum tuberosum.* Linn. Herb. Madr. Wall. Catal. Suppl. n. 232.—Cultum.

31. *Solanum calycinum.* N. ab E.

S. frutescens (?), inerme, pubescenti-hirtum, pubescentia stellata, foliis ovatis integerrimis vel subrepandis, racemo terminali, calyce corollaque infundibuliformibus, anthera una longiori.

" Solani pubescentis var. ?" *Herb. Madr., Wall. Catal. Suppl. n.* 237. (adjecto tamen exemplo uno *Sol. pubescentis* genuini), ex Herb. Heyn. (*Wall.* l. c. *n.* 246.).

Solani pubescentis monstrosam prolem indicares, sed nihil monstrosi usquam in eo cognovi, perfecta sunt corolla et stamina, adest bacca matura. Singularitas sita est in calyce corollaque a communi generis typo aberrantibus.

II. Lycopersicum. *Dun.*

Calyx quinque- vel sex-partitus, persistens. *Corolla* rotata, quinque-sexfida, plicata. *Antheræ* conniventes, apice membranaceæ et cohærentes, rima longitudinali introrsum dehiscentes. *Bacca* bi-plurilocularis, polysperma, nuda. *Semina* hirsuta.

1. *Lycopersicum esculentum.* Mill.

L. pilosum, pilis diversis, foliis inæqualiter pinnatisectis, segmentis incisis apice attenuatis subtus glaucescentibus, laciniis calycis corollam subæquantibus, bacca angulata.

Lycopersicum esculentum. *Mill. Dict. n.* 2. *Dun. Sol. p.* 113. *tab.* 3. *f.* 3. *R. et Sch. S. V.* iv. *p.* 568. *n.* 9.

Solanum Lycopersicum. *Linn. Sp. Pl.* i. *p.* 150. *Plenck, Pl. Off. tab.* 122. *Lour. Fl. Cochinch. ed. Willd.* i. *p.* 191. *n.* 8. *Roxb. Fl. Ind.* ii. *p.* 245. *n.* 3. *Wall. Catal. n.* 2611, C.

Pomum amoris. *Rumph. Herb. Amb.* v. *p.* 416. *tab.* 154. *fig.* 1.

Vidi exempla in Herbb. Madr., Heyneano, Wightiano, et ad ripam fl. Saluen (a *Guil. Gomez* lecta), *Wall. Catal. Suppl. n.* 268. Alterum ex Herb. Russelliano citatur a cl. Wallichio sub *n.* 2611, A.

Foliorum partitionibus magis attenuatis ideoque longioribus corollaque ratione calycis breviore diversum a *Lycopersico Humboldtii.* Baccæ plerumque majores, lobatæ et irregulares.

Lycopersicum cerasiforme Dun. vix specie differt. Nobis planta fructu regulari biloculari videtur, illud autem (*Lycopersicum esculentum*) cultura alienatum, baccis pluribus e florum complurium coalitione in unam, eamque multo majorem lobatam irregularem et multilocularem coëuntibus. Etiam in culta

planta occurrunt flores fructusque minores, æquales, iisdem *Lycopersici cerasiformis* omnino congrui. Citatur autem in *Catal. Wallich. n.* 2611, D. *Solanum Pseudolycopersicum* Herb. Hamilt., e Patna, quod idem ac *Lycopersicum cerasiforme* Dun. Igitur hæc etiam forma in India Orientali occurrit, teste etiam Rumphio, *Amb.* v. p. 416., ubi posterius hoc *Tamatte Bontal* appellatur et "libris Europæis *ignotum* foliisque minoribus et glabrioribus" esse dicitur.

Adnot. Ex America Indiæ Orientali illatæ sunt hæ Lycopersici generis species; nunc fortasse sub cœlo idoneo sponte se propagantes.

2. *Lycopersicum Humboldtii.* Dun.

L. pilosum, pilis diversis, foliis inæqualiter pinnatisectis, segmentis incisis subtus glaucescentibus, pedunculis pedicellisque ebracteatis, laciniis calycis corolla duplo brevioribus.

Lycopersicum Humboldtii. *Dun. Sol. p.* 112. *R. et Sch. S. V. p.* 567. *n.* 6.
Solanum Humboldtii. *Willd. Hort. Berol.* i. *tab.* 27.
Solanum Lycopersicum. *Wall. Catal. n.* 2611, B. *Roxb. Fl. Ind.* ii. *p.* 245. *n.* 3. (ex parte).

Vidi exemplum ex Hort. Bot. Calcutt.

Adnot. Character essentialis in calycis laciniis brevioribus foliorumque partitionibus brevioribus minus attenuatis angulisque incisurarum magis obtusis præditis quærendus est. Baccæ cultura non minus angulatæ et lobatæ evadunt, ac in *Lycopersico esculento.*

III. Capsicum. *Linn. Fingerhuth. Diss.*

Calyx quinquedentatus, persistens. *Corolla* rotata, quinquefida. *Antheræ* conniventes, bilocellatæ, rimis dehiscentes. *Bacca* exsucca, chartacea, cava, 2—4-locularis, polysperma, nuda. *Semina* nuda.

1. *Capsicum grossum.*

C. calyce fructus pateriformi patulo sinuato-dentato, pedunculis fructiferis solitariis erectis reflexisve, bacca oblonga ovatave torosa, foliis ovatis acuminatis, ramis pubescentibus.

Capsicum grossum. *Roxb. Fl. Ind.* ii. *p.* 260. *n.* 3. *Willd. Sp. Pl.* i. *p.* 1051.

(excl. var. β.). *R. et Sch. S. V.* iv. *p.* 562. *n.* 10. *Fingerh. Diss. de Capsico* (c. synon.)

Capsicum grossum. *Wall. Catal. n.* 2643, A.

β. Ramis glabriusculis, fructibus pendulis, foliis latioribus basi valde inæqualibus subrepandis vel adeo hinc inde incisis.

Capsicum grossum. *Wall. Catal. n.* 2643, B.

γ. Cordatum. *Fingerh. Diss. tab.* 6. *f.* a. *Herb. Wight. propr.*

Habitat in Nepalia, secundum Roxburghii sententiam. Vidi exemplum var. α. ex Herbario Hamiltoniano, in Patgong Martio mense cum fructibus maturis lectum. In omni India colitur. Var. β. in Herb. Wightiano, ex Horto Missionis Manillensis decerpta, ut dubia species, addita brevi descriptione, servatur.

Nomen in lingua Bengalensium *Kaffree-murich* (*Roxb.*).

Calycis forma constans sufficit ad speciem dignoscendam.

Varietas β. dubia, num *Capsici annui* sit varietas pendula.

Adnot. Distinctio inter annuas Capsicorum species et frutescentes falsa est; omnes enim in plagis calidis persistunt, in fruticulos conversæ.

2. *Capsicum frutescens.* Linn. Hort. Cliff.

C. calyce fructus cylindrico subtruncato, pedunculis fructiferis solitariis, bacca conico-attenuata incurva, foliis ovalibus utrinque acuminatis, petiolis ramisque angulatis pubescenti-hirtis.

Capsicum frutescens. *Linn. Hort. Cliff. n.* 59. *Willd. Sp. Pl.* i. *p.* 1051. *R. et Sch. S. V.* iv. *p.* 563. *Lour. Fl. Cochinch. ed. Willd.* i. *p.* 158. *Roxb. Fl. Ind.* ii. *p.* 201. *n.* 4. *Blume, Bydr. p.* 704. *Wall. Catal. n.* 2642, C. (ex parte).

Capsicum minus rubrum et flavum. *Rumph. Herb. Amboin.* v. *p.* 248. *tab.* 88. *figg.* 1. *et* 3.

Capo Molago. *Rheede, Hort. Malab.* ii. *p.* 109. *tab.* 56.

Crescit in arenosis (*Rheede*). "Ego puto esse plantam indicam, ab antiquis jam temporibus per totam Indiam Orientalem notam, nullaque est ædicula, seu area tam pusilla, nec ullus pater-familias tam pauper, si modo terræ angulum prope casam possideat, quin *Tschili* concedat locum, cum

aroma adeo sit familiare et catholicum, ut quotidiano conducat cibo," (*Rumph.*).—In hortis et ad sepes Javæ frequentissimum (*Blume*). Vidi exemplum ex Herb. Wight.—Nomen apud Bengalenses *Lal gachh Lunka murich*, vel *Lal Lunka murich*, et varietatis croceæ simpliciter *Gachh murich* (*Roxb.*); *Tschili mera*, et Baleyice *Tabe Kling* (var. rubra), *Tschili Cuning*, Baleyice *Tabe Rawit* (*Rumph.*); Javanice *Tjabe bezaar* (*Blume*).

Adnot. Species satis distincta ab illa, quam plurimæ hortorum nostrorum enumerationes, et cum iisdem Fingerhuthius, *frutescentis* Capsici nomine, ad Linn. *Spec. Plant.* respicientis, colunt.—Nostra 3 pedum altitudine et altior frutex, etc.

3. *Capsicum fastigiatum.* Blume.

C. frutescens, ramis tetragonis fastigiatis divergentibus pubescenti-scabris, calyce fructus subcylindrico truncato, pedunculis fructiferis subgeminis erectis, bacca oblongo-cylindracea recta, foliis ovalibus lanceolatisve utrinque acuminatis minute serrulato-ciliatis.

Capsicum fastigiatum. *Blume, Bydr. p.* 705.

Capsicum minimum. *Roxb. Fl. Ind.* ii. *p.* 201. *n.* 5. *Wall. Catal. n.* 2641, A, B*.

Capsicum frutescens. *Linn. Sp. Pl.* i. *p.* 271. *Burm. Fl. Ind. p.* 58. (excl. synon. Hort. Cliff., Rumph. et Rheed.). *Fingerh. Diss.* (excl. plerisque synon.). *Wall. Catal. n.* 2642, A. B. C. (ex parte).

Capsicum baccatum. *Herb. Hamilt., Wall. Catal. n.* 2644.

Crescit in India spontaneum? Vidi exempla Herbariorum Russelliani, Heyneani, Wightiani et Hamiltoniani, nusquam autem loci natalis notitiam inveni; ex Hort. Bot. Calcutt. (*C. frutescens*), Wall. Catal. Suppl. n. 257.; ex Herb. Madr. (*C. baccatum*), Wall. l. c. n. 223. (forma magis herbacea et divergens, ad *C. pyramidale* Mill., Fingerh. Diss. tab. 3. fig. e. accedens), Hort. Bot. Calcutt. (*C. minimum*), Wall. l. c. n. 263.; ex Hort. Mission. Morav. in Herb. Madr. (*C. purpureum* Roxb.), Wall. l. c. n. 220. In Javæ insulæ hortis et locis incultis (*Blume*). Nomen in Bengalensium lingua *Dhan Lunga murich* (*Roxb.*); apud Javanos *Tjabe Rawiet* (*Blume*).

* *Minimi* nomen mutandum ob *C. minimum* Mill. antiquius et probabiliter diversum, saltem incertum.

A *Capsico frutescente* satis differt caule humiliore patulo fastigiato dichotomo-ramosissimo, ramis magis patentibus flexuosis tetragonis pube minutissima, vix nudis oculis percipienda, scabris, lineis geminis elevatis, a foliorum paribus decurrentibus distantibus, quam in aliis speciebus multo evidentioribus, alternis lateribus notatis . . . et rell.

Adnot. 1. Calycis dentes subulatos patentes postulat Roxburghius l. c., quos equidem plurimis in exemplis, ex Horto Calcuttensi allatis *minimi*que Capsici nomine inscriptis, non inveni, sed breves tantum denticulos, obtusos vel acutiusculos in fructu fere evanescentes, quo calyx plerisque truncatus apparet. Quod si dentes ejusmodi revera in specie, a Roxburghio edita, existunt, hanc ex Horto Calcuttensi penitus exulam, cum alia eademque Blumiana illa specie denique commutatam esse statuendum. Additis dentibus subulatis, *Capsico microcarpo* Candollei, seu *ciliari* Willdenowii, propius accederet species Roxburghiana, nec fere, nisi fructus figura, recederet. An species spuria, e *Capsici ciliaris* foliis et flore, *fastigiati* autem fructu conflata?

Adnot. 2. Secundum nomen, a Rumphio "Capsico minori flavo" adscriptum (*Tabe Rawit*), quod Blumius noster a Javanis *Capsico fastigiato* tribui dicit (*Tjabe Rawiet*), species illa Rumphiana ad *C. fastigiatum* citanda esse videtur; sed obstant fructus, in icone solitarii, majoresque et magis attenuati, quare hanc et illam speciem, ubi fructu luteo gaudeant, promiscuas eodem nomine appellari ab indigenis suspicans, figuras 1. et 3. tabulæ 88. operis Rumphiani *Capsico frutescenti* adscripsi.

Adnot. 3. A *Capsico conico* Meyeri præsertim caule frutescente, nec annuo, recedit, et præter durationem (per se quidem a cœlo pendentem) vix aliam notam constantem, qua possis distinguere, prodit.

4. *Capsicum Chamæcerasus.* N. ab E.

C. frutescens, ramis subtetragonis contractis glabris, calyce fructus laxo amplo cupuliformi integerrimo, pedunculis solitariis erectis, bacca globosa, foliis lanceolatis glabris.

Capsicum cerasiforme. *Poir. Enc. Meth. Suppl.* v. *p.* 325. (nec Willd.).

Capsicum purpureum. *Hort. Bot. Calc., Wall. Catal. Suppl. n.* 206. (ad partem).

Species bene distincta calyce fructus amplo, baccam non contingente, mem-

branaceo cupulari, et, propter has differentias, cum *Capsico cerasiformi* Willd. haud confundenda.

Adnot. Præter dictas species, sequentes adhuc occurrunt in Herbarii Indici supplementis, quas, hortorum peregrinas hospites, hic indicasse sufficiet:

a. *Capsicum annuum, var.* ζ. *abbreviatum.* Fingerh. Diss. tab. 2. fig. f. Herb. Wight. propr.

b. *Capsicum cordiforme, var.* γ. *majus.* Fingerh. l. c. tab. 9. fig. e. Ex Herb. Madr. (*C. annuum* Hort. Miss. Morav.), Wall. Catal. Suppl. n. 222.

c. *Capsicum tetragonum.* Mill. Fingerh. l. c. tab. 10. fig. d. Wall. Catal. l. c. n. 224.

d. *Capsicum sphæricum.* Willd. Fingerh. l. c. tab. 9. fig. a. Ex Herb. Madr. (*C. cerasiforme*), Wall. l. c. n. 221.

IV. Physalis. *Linn.*

Calyx quinquedentatus. *Corolla* campanulato-rotata, plicata, quinqueloba. *Antheræ* conniventes, longitudinaliter dehiscentes. *Stigma* capitatum. *Bacca* calyce inflato angulato membranaceo inermi tecta, bilocularis, polysperma.

1. *Physalis somnifera.*

P. fruticosa, foliis integerrimis, floribus confertis.

Physalis somnifera. *Link, Enum. Hort. Berol.* i. *p.* 180. *n.* 1699. *N. ab E. in Schlechtend. Linnæa,* 6. *p.* 453. *n.* 1. *Wall. Catal. Suppl. n.* 250. *α**. (ex Hort. Bot. Calcutt.).

Tanquam varietates, nullis vero certis limitibus distinguendæ, notari possunt:

α. (*flexuosa*), caule magis flexuoso, foliis pubescentibus vel pubescenti-tomentosis, floribus minoribus, laciniis calycis tubum suum subæquantibus.

Physalis flexuosa. *Linn. Sp. Pl.* i. *p.* 261. *Willd. Sp. Pl.* i. 2. *p.* 1020. *R. et Sch. S. V.* iv. *p.* 670. *Jacq. Ecl. tab.* 23. *Roxb. Fl. Ind.* ii. *p.* 240.

Pevetti. *Rheede, Hort. Malab.* iv. *p.* 113. *tab.* 55.

Vulgaris, omnique fere solo situque crescens in India Orientali. Occurrit:

* caule foliisque pubescenti-tomentosis, vel foliis etiam glabriusculis.

Physalis flexuosa. *Wall. Catal. n.* 2635, A. B. C. D. H. in Herbario Russelliano; ex Hort. Bot. Calcutt.; in Hurdwar, in Kamoon (*R. B.*); in Balahat (Herb. Hamilt. nomine *Physalidis Sugundæ* †).

** caule tomentoso vel lanato, foliis pubescenti-tomentosis, canescentibus.

Physalis flexuosa. *Wall. Catal. n.* 2635, E. G. in Herbb. Heyneano et Hamiltoniano e Monghir.

Physalis tomentosa. *Herb. Heyn.*

β. (*somnifera*), caule minus flexuoso, floribus dimidio majoribus, calycis laciniis tubo modo brevioribus vel eundem adæquantibus; * (*Ph. somnifera communis*), caule floribusque tomentoso-lanatis, foliis pubescenti-tomentosis vel glabriusculis.

Physalis somnifera. *Linn. Hort. Cliff. p.* 62. *Sp. Pl.* i. *p.* 261. *Willd. Sp. Pl.* i. *p.* 1019. *Jacq. Ecl. tab.* 22. *Sieber, Pl. Cret.*

Physalis arborescens. *Thunb. Prodr. Fl. Cap. p.* 37. *Fl. Cap.* i. 190.

** (*Ph. somnifera tomentosa.*)

Physalis tomentosa. *Thunb. Prodr. Fl. Cap. p.* 37. *Fl. Cap. ed. Schult.* i. *p.* 191. *Willd. Sp. Pl.* i. *p.* 1021. *R. et Sch.* iv. *p.* 671.

Habitat β*. in Græciæ insulis, Canariis, inf. Mauritii et Cap. Bon. Sp.; β**. in Cap. Bon. Sp. cum β*.; var. β**. ad ripam Irrawadi flum. Sept. 1826, c. fruct. mat. (*Guil. Gomez*).

2. *Physalis peruviana.*

P. herbacea, perennis, basi tuberosa, pilis simplicibus dense pubescenti-villosa, caule erecto subramoso, foliis cordatis acuminatis integris dentatove-sinuatis subtomentosis, corolla maculata, antheris violaceis, calycibus fructus ovatis subæqualibus pallidis. *N. ab E. in Schlechten. Linnæa*, 6. *p.* 464. *n.* 8.

α. Foliis magis minusve dentatis.

Physalis esculenta. *Willd. in Act. Amic. N. Cur. Berol.* iv. *p.* 197. *R. et Sch.*

† *Physalis Sugunda* Herb. Hamilt., in Balahat lecta, a reliquis non differt, nisi foliis majoribus magis flaccidis. Huic respondet Physalis Alpini, *Jacq. Ecl.* i. *p.* 39., *et Prosp. Alp. de Pl. Exot. p.* 71. *t.* 70.

S. V. p. 674. (Vidi in Herb. Willd. nomine *P. esculentæ* Roxb. a Kleinio ex India Orientali missa exempla).

Physalis tomentosa. *Medici in Act. Acad. Scient. Palatin.* iv. *p.* 184. *tab.* 4.

Physalis peruviana. *Roxb. Fl. Ind.* ii. *p.* 241. *n.* 3. (ex parte). *Wall. Catal. n.* 2634, B. (ex parte) et E., ex Hort. Bot. Calcutt. *Wall. Catal. Suppl. n.* 259. et 266. ex Herb. Madr. (*P. esculenta*), *Wall.* l. c. *n.* 225. et in Herb. Heyn.

β. Foliis subintegerrimis.

Physalis peruviana. *Linn. Sp. Pl.* i. 1670. *Willd. Sp. Pl.* i. 2. *p.* 1022. *Enum. Hort. Berol. p.* 232. *Link, Enum.* i. *p.* 181. *R. et Sch.* l. c. *p.* 674. *n.* 12. *Herb. Wight.*

Physalis pubescens. *Linn. Herb. Ruiz et Pav. Fl. Peruv.* ii. *p.* 41. *R. et Sch.* l. c. *p.* 675. *Spr. S. V.* i. *p.* 698. Willd. Herb. ex India Orientali Roxb. (alterum exemplum *Ph. minimam* exhibet).

Physalis edulis. *Sims, Bot. Mag. tab.* 1068. *Catal. Hort. Taur.* 1813.

Physalis tuberosa. *Zuccagn. Obs. Cent. n.* 43. *in Rom. Coll. p.* 130.

Physalis latifolia. *Lam. Ill. n.* 2407. *R. et Sch.* l. c. *p.* 678.

Physalis barbadensis. *Lam. Enc. Meth.* ii. *p.* 102. *n.* 12. non Jacq.

Habitat in Peruvia, Limæ (*Willd.*); in Quindiu (*Humb.*); in Antillis (var. β. *Lam.*). Colitur in India Orientali (v. s. α. et β.). In Nova Hollandia ad Port Jackson quasi sponte (*R. Br.*). Madeira (*Holl.*).

3. *Physalis pubescens.* Linn.

P. herbacea, annua, ramosissima, pubescenti-subtomentosula, foliis basi inæqualibus cordatis acuminatis dentatis, corollis maculatis, antheris violaceis, calycibus fructus ovato-acuminatis acute angulatis basi retusis. *N. ab E. in Schlechtend. Linnæa,* 6. *p.* 467. *n.* 9.

α. Foliis basi integris.

Physalis pubescens. *Linn. Hort. Cliff. n.* 62. *Sp. Pl. p.* 262. *Lam. Enc. Meth.* ii. *p.* 101. *Pursh, Fl. Am. Sept.* i. *p.* 157. *Wall. Catal. Suppl. n.* 226. et 276. (ad fl. Saluen Guil. Gomez legit.) *Herb. Madr.* (P. angulata ad partem), *Wall.* l. c. *n.* 225.

Physalis peruviana. *Wall. Catal. n.* 2634, C. D. F.

Variat α* foliis repando-subdentatis. *P. staminea* Muhlenb. in Herb. Willd.

β. Foliis etiam basi dentatis.

Physalis pubescens, β. *Lam. Enc. Meth.* iv. *p.* 101. *n.* 9.

Physalis pruinosa. *Linn. Sp. Pl.* i. *p.* 263. *Willd. Sp. Pl.* i. 2. *p.* 1024.

Physalis barbadensis. *Jacq. Misc.* ii. *p.* 359. *Ic. Rar.* i. *t.* 39. *Willd. Sp. Pl.* i. *p.* 1023. *Enum. p.* 232. *Link, Enum.* i. *p.* 181. *R. et Sch. S. V.* iv. *p.* 676. *n.* 17. *Hornem. Hort. Havn.* i. *p.* 217.

Crescit var. α. in America Boreali. In India Orientali fortasse non nisi culta provenit. Juventa est in Nepalia (*Wall.*), ibidem in montibus (vix tamen indigena, *Wall.*) ; in Gualpara (*Herb. Hamilt.*).—β. in America.

4. *Physalis minima.* Linn.

P. herbacea, annua, laxe villosa, ramoso-diffusa, foliis cordatis ovatisve acuminatis serrato-dentatis subintegerrimisve pilosis, corollis immaculatis, antheris luteis, calycibus fructus ovatis angulatis hirtis, laciniis sub anthesi triangulari-acuminatis tubo brevioribus. *N. ab E. in Schlechtend. Linnæa*, 6. *p.* 479. *n.* 16.

Physalis minima. *Linn. Hort. Cliff. p.* 62. *Roxb. Fl. Ind.* ii. *p.* 242. *n.* 4. (ex parte). *Herb. Wight.* (cum *P. indica*).

Physalis villosa. *Roth, Nov. Pl. Sp. p.* 122.

Physalis Rothiana. *R. et Sch. S. V.* iv. *p.* 677. *n.* 20.

Physalis peruviana. *Wall. Catal. n.* 2634, B. (partim) et F. (Physalis angulata, peruviana et pubescens, *Herb. Heyn.*; et P. barbadensis et peruviana, *Herb. Wight.*).

Physalis pubescens. *Herb. Willd.* ex altera parte. (Misit Klein. ex India Orient.)

Pee inota-inodien. *Hort. Malab.* x. *p.* 140. *tab.* 71 ?

Physalis parviflora. *Lag. Gen. et Sp. Nov. p.* 11. *Willd. Enum. p.* 11. *Suppl.*

Physalis Lagascæ. *R. et Sch. S. V.* iv. *p.* 679.

Crescit in Vera Cruz ? (*Miller.*) Indiæ Orientalis certa civis ("in arenosis" (*Herb. Sehlmeyer.*), "in graminosis et ruderatis" (*Herb. Willd.*).

Adnot. Physalidis villosæ nomine sibi a b. Heynio missam esse cl. Roth l. c. refert. Mirum ideo, hoc nomen inter plantas Heyneanas non occurrere.

5. *Physalis angulata.* Linn.

P. herbacea, annua, ramosissima, glabra, foliis ovatis oblongisve acutis grosse inæqualiter dentato-serratis (in var. β. subintegerrimis), corollis immaculatis, antheris pallide cœrulescentibus, calycibus fructus quinquangulatis basi truncatis, laciniis sub anthesi triangulari-subulatis tubum suum æquantibus. *N. ab E. in Schlechtend. Linnæa,* 6. *p.* 474. *n.* 14.

Physalis angulata. *Linn. Hort. Cliff. p.* 62. *Hort. Ups. n.* 50. *Sp. Pl. p.* 262. *Willd. Sp. Pl.* i. *p.* 1022. *R. et Sch. S. V.* iv. *p.* 676. *n.* 19. (cum synon. excl. var. β.) *Herb. Madr., Wall. Catal. Suppl. n.* 253.

Physalis obscura α. glabra. *Pursh, Fl. Am. Sept.* i. *p.* 157. (β. ejusd. ad *P. pubescentem* β. nostram pertinet.)

Physalis peruviana. *Wall. Catal. n.* 2634, A. E. G. H.

Physalis minima. *Wall. Catal. n.* 2633. ex Hort. Bot. Calcutt.

Physalis flexuosa et angulata, *Herb. Russell.*—P. angulata, *Herb. Heyn.*—P. flexuosa et Sugunda (ex parte), *Herb. Hamilt.*

Inota Inodien. *Rheede, Hort. Malab.* x. *p.* 139. *tab.* 70.

β. Foliis oblongo-lanceolatis basi apiceque acuminatis, caule diffuso.

Physalis patula. *Mill. Dict. n.* 12.

γ. Foliis oblongis subintegerrimis. *P. angulata* β. foliis integerrimis. *Linn.*

Habitat in India utraque: in Monghir et Balahat (*Herb. Hamilt.*). In Hort. Bot. Calcutt. culta, *P. peruvianæ* nomine. β. In Vera-Cruz (*Mill.*); Brasilia (*Maximil. Princ. Neowid*). γ. In Bonaria (*Dill.*).

6. *Physalis indica.* Lam.

P. herbacea, annua, caule divaricato-dichotomo ramisque flexuosis petiolisque tenuissime viscido-pubescentibus scabriusculis, foliis ovatis oblongisve subdentatis, corollis immaculatis, antheris luteis, calycibus fructus ovatis subangulatis, laciniis sub anthesi triangularibus tubo duplo brevioribus. *N. ab E. in Schlechtend. Linnæa,* 6. *p.* 476. *n.* 15.

α. Foliis angustioribus, calycibus fructus ovatis.

Physalis indica. *Lam. Enc. Meth.* ii. *p.* 102. *n.* 14.

Physalis pseudo-angulata. *Blume, Bydr. p.* 706.

Physalis parviflora. *R. Br. Prodr. Fl. N. Holl.* i. *p.* 447. (*ed. N. ab E. p.* 303.).

n. 2. *R. et Sch. S. V.* iv. *p.* 680. *n.* 28. (Semina punctata, cum a *Physalide peruviana* seu *pubescente* Brownii ut distinguatur, necesse sit, optimæ sunt notæ; in plurimis autem hujus generis speciebus istiusmodi semina inveniuntur.)

Physalis Alkekengi. *Lour. Fl. Cochinch. ed. Willd.* i. *p.* 164. *n.* 4.

Physalis angulata. *Herb. Willd.* ex parte, (exempl. a Kleinio ex Ind. Orient. missum.) *Herb. Madr.* (ad partem), *Wall. Catal. Suppl.* 225. *Herb. Wight.*, *Wall.* l. c. *n.* 211.

Physalis minima. *Mill. Dict. n.* 11. *Roxb. Fl. Ind.* ii. *p.* 242. *n.* 4.

Nicandra indica. *R. et Sch.* l. c. *p.* 682.

Solanum vesicarium indicum. *Herm. Lugdb. p.* 569. *tab.* 571.?

Halicacabus indicus minor niger. *Rumph. Herb. Amb.* vi. *p.* 61. *tab.* 26. *f.* 1. optima (!).

Physalis peruviana. *Wall. Catal. n.* 2634, K.

β. microcarpa, floribus fructibusque duplo minoribus, calycibus fructus subglobosis.

Physalis divaricata. *Don, Fl. Nepal. p.* 97. *n.* 2.

Physalis peruviana. *Wall. Catal. n.* 2634, G. et B. (ex parte).

Physalis angulata, var. β. *Herb. Hamilt.*—P. angulata. *Herb. Heyn.*

Habitat (α.) in Cochinchina (*Loureiro*); in Java insula (*Blume*); in Indiæ Orientalis continente (*Herb. Wight.*); in Nova Hollandia (*R. Br.*): vidi exempla Javanica et in Herb. Wight. Var. β. crescit in Nathpur (*Herb. Hamilt.*); in Nepalia (*Wall.*). In Herb. Heyn. (nom. *Physalidis angulatæ*); ad pagum Bassaria (*Don*).—Hæc certo Ind. Orient. civis.

Adnot. 1. Folia radicalia et caulina inferiora in luxuriantibus cordato-orbiculata.

Adnot. 2. Quæ sit *Physalis minima* Linn. Hort. Cliff. et Roy. Lugdb. "ramosissima, pedunculis fructiferis *folio villoso longioribus*," dubium est. (Fortasse error calami seu typographi subest.)

Adnot. 3. Stigma integrum, quo charactere *P. minima* in *Fl. Ind.* l. c. maxime distinguitur a *P. peruviana*, etiam in *P. angulata* aliisque, sub isto nomine complexis, observatur.

Adnot. 4. Exemplum unum, quod a cl. Wallichio *P. minimæ* nomine mis-

sum est, ad *P. angulatam* spectat, cui etiam synonymon *Inota-Inodien*, Rheed. *Hort. Malab.* certo convenit, a Roxburghio ad *P. minimam* citatum. *Definitio* autem Roxburghiana ad veram *P. minimam* luculenter respicit, cum plantam pubescentem, folia inprimis "downy on both sides" exhibeat. Dubius, an fidem majorem tribuam exemplo, facile commutabili, an verbis expressis auctoris; eam denique sententiam secutus sum, ut ad utramque citarem locum Roxburghii.

V. Anisodus. *Link.*

Calyx campanulatus, angulatus, quinquefidus, laciniis inæqualibus. *Corolla* campanulata, quinqueloba, lobis rotundatis sensim minoribus. *Stamina* inclusa, basi corollæ inserta, recta. *Bacca* calyce inflato erecto coriaceo reticulato decemcostato tecta, bilocularis, polysperma, operculata, operculo subquadrivalvi mucronulato. *Receptacula* seminum crassa, ovata, scrobiculata. *Semina* compressa, angulata, punctulata; testa coriacea, solubilis; membrana interna grisea, tenuis, rugulosa, albumini adhærens. *Albumen* carnosum, rufescens. *Embryo* periphericus, semicircularis, pallidus, radicula conica obtusa, cotyledonibus semicylindricis.

Anisodus. *Link et Otto, Abbild. schönblühender Gewächse der königl. Gart. zu Berlin, fasc.* vi. *p.* 77. *Spr. S. V.* i. *p.* 512. *n.* 754. *Gen. Pl.* i. *p.* 159. *n.* 800.—Nicandra, *Link et Otto.*—Physalidis spec., *Wall.*—Whitleya, *Sweet.*

Anisodus luridus. *Link* l. c. *Spr. S. V.* i. *p.* 699.

Nicandra anomala. *Link et Otto* l. c. *tab.* 35.

Physalis stramonifolia. *Wall. in Roxb. Fl. Ind.* ii. *p.* 242. *n.* 5. *Wall. Catal. n.* 2632.

Whitleya stramonifolia. *Sweet, Brit. Fl. Gard. tab.* 125.

Habitat in summo monte Emodo ad Gossain Than (*Wall.*). Cultus in Horto Berolinensi e semine Nepalensi, ex Anglia allato; sub diu persistens.

Cum clarissimus Wallich fructiferam plantam solum observaverit, quæ descriptioni, cæteroquin accuratissimæ, desunt, hic loci inseram. Flos sub anthesi nutans. Calyx campanulatus, viridis, decemangulatus, pubescens, limbo brevi

quinquefido, laciniis ovato-oblongis obtusis, inferioribus sensim majoribus. Corolla calyce paullo longior, campanulata, limbo quinquelobo, lobis patulis latotrigonis obtusis, inferioribus paullo majoribus. Color corollæ viridis, limbo demum purpurascente. Stamina tubo corollæ basin versus inserta, basique venis arcuatis connexa, corolla breviora; filamenta recta, alba, glabra; antheræ erectæ, bilocellatæ, flavescentes. Germen hemisphæricum, glabrum. Stylus longitudine corollæ. Stigma capitatum. Operculum capsulæ (seu baccæ) planum, margine quadrilobum, stylo persistente longe mucronatum.

VI. Datura. *Linn.*

Calyx tubulosus, angulatus, quinquedentatus, e basi orbiculata patente deciduus. *Corolla* conico-infundibuliformis, limbo plicato repando-quinquedentato dentibus productis. *Stigma* bilobum. *Capsula* coriaceo-succulenta, bilocularis, quadrivalvis, polysperma. *Trophospermia* septiformia. *Semina* reniformia.

1. *Datura alba.* Rumph. (Wall. Catal. Suppl. n. 260.)

D. annua, foliis ovatis acuminatis repando-dentatis basi inæqualibusauleque glabriusculis, fructibus nutantibus spinosis.

Stramonia indica prima seu Datura alba. *Rumph. Herb. Amb.* v. *p.* 242. *tab.* 87. *f.* 1. (Calyx nimis brevis in icone et ad *Daturam fastuosam*, ut videtur, effictus.)

Datura Metel. *Roxb. Fl. Ind.* ii. *p.* 238. *Wall. Catal. n.* 2639. *Fleming in Asiat. Res.* xi. *p.* 165. *Hardw. in Asiat. Res.* vi. *p.* 351. (*D. Stramonium.*)

Humalu. *Rheede, Hort. Malab.* ii. *p.* 47. *tab.* 28.

Crescit ubique per omnem Indiam Orientalem, v. c. in Nepalia, in Silhet, Tavoy, etc. Floret omni anni tempore. In Horto Calcuttensi culta perstitit.

Obs. Datura Metel Linn. Sp. Pl. i. p. 1009, "foliis cordatis subintegris pubescentibus," ex Africa et insulis Canariis allata, distincta est species, differt primo intuitu caule mollissime denseque pubescente, canescente, etc. *Datura alba* Rumphii autem caule foliisque distinguitur non magis quam in *D. Stramonio* pubescentibus, his læte viridibus, etc.

Adnot. 1. Pubescentiam non multum valere in speciebus distinguendis, lubenter concedimus, in ista vero specie aliquid eidem tribui fas esse, hisce probamus:

1. Si *Datura Metel* hortorum et insularum Canariensium cultura mutatam censeas, cur non, secundum regulam, pubescentiam deposuisse, sed induisse contendis?

2. Foliorum forma et color, tum calycis omnino cylindrici neque nervosi pubescentis indoles atque proportiones minime cultura explicantur.

3. *Datura Metel* nostras et *D. alba* Rumphii cultæ non mutabantur.

4. *Datura Stramonium* Indiæ Orientalis pubescentia aliquanto uberiori, nec parciori, prodit.

Adnot. 2. Sub *Datura Stramonio*, in Nepalia lecta (*Wall. Catal. n.* 2637, *α.*), *D. alba* cum *D. Stramonio* promiscue occurrebat.

2. *Datura fastuosa.* Mill. (Wall. Catal. n. 2638.)

D. annua, foliis ovatis acuminatis repando-dentatis basi inæqualibus cauleque subpuberulis, fructibus nutantibus tuberculatis.

Datura fastuosa. *Mill. Dict. n.* 6. *Sabb. Hort.* i. *t.* 93. *Willd. Sp. Pl.* i. *p.* 1008. *n.* 4. *R. et Sch. S. V.* iv. *p.* 306. *Roxb. Fl. Ind.* ii. *p.* 238. *Herb. Madr.*, *Wall. Catal. Suppl. n.* 219.

Stramonia indica tertia seu Datura rubra. *Rumph. Herb. Amb.* v. *p.* 243. *tab.* 87. *f.* 2.

Variat in hortis flore pleno, corolla una ex altera nascente.

Crescit in diversis Indiæ Orientalis partibus, v. c. in Dumariya et Dervani (*Herb. Hamilt.*). Vidimus etiam in Herb. Heyn. et cult. ex Hort. Calcutt.

β. *parviflora*, corolla minore, calyce tubo corollæ plus duplo breviore. Prome, (*G. Gomez*). *Wall.* l. c. *n.* 279.

3. *Datura trapezia*, annua, foliis trapezoideo-ovatis acutis repando-dentatis cauleque pubescentibus, fructibus spinosis erectis.

"Datura Stramonium." *Wall. Catal. Suppl. n.* 278.

Ad ripas præruptas Irawaddi fluvii Septembre 1826, legit G. Gomez.

An var. *D. fastuosæ*? a qua, præter pubescentiam et folia minora ac breviora præsertim differt fructibus spinosis.

4. *Datura ferox.* Linn.

D. annua, foliis ovatis angulato-dentatis basi cuneiformibus glaucis, fructibus ovatis erectis pyramidato-spinosis, calyce limbi corollæ diametro longiore.

Datura ferox. *Linn. Amœn. Acad.* iii. *p.* 403. *Willd. Sp. Pl.* i. *p.* 1007. *Mill. Dict. n.* 4.

Stramonium ferox. *Zanon. Hist. ed. Mont. p.* 212. *tab.* 162. *Moris. Hist.* iii. *p.* 607. *sect.* xv. *tab.* 2. *f.* 4. *Boccon. Rar. p.* 50.

Stramonium longioribus aculeis. *Barrel. Ic. tab.* 1172.

Datura Stramonium β. canescens. *Wall. in Roxb. Fl. Ind.* ii. *p.* 229. *Catal. n.* 2637.

Crescit in montosis Nepaliæ (*Wall.*); in Matiyari (*Herb. Hamilt.*). Vidi et in Herb. Heyn. cum *D. Tatula* mixta exempla.

Adnot. 1. Descriptio Wallichiana, l. c. impressa, optima, et optime quidem ea congrua cum Zanoniana, quam Montius l. c. tradidit. Flos in exemplo Herbarii Hamiltoniani minor est, quam in Wallichiano, e Nepalia allato, reliqua congruunt.

Adnot. 2. Spinæ capsulæ quatuor supremæ majores perhibentur a Linnæo, casu fortasse unove solo exemplo. In nostris, ut etiam in icone Zanoniana, spinæ subæquales, inferiores autem paullo minores, omnes e basi lata fortique conicæ, rectæ.

Datura Stramonium, vere si differt a *D. feroce*, definienda:

5. *Datura Stramonium.* Linn. (Wall. Catal. n. 2637.)

D. annua, foliis ovatis angulato-dentatis basi cuneiformibus glabriusculis viridibus, fructibus ovatis erectis dense spinosis, calyce limbi corollæ diametrum æquante.

6. *Datura Tatula.* Linn. (Wall. Catal. n. 2640.)

D. annua, foliis cordato-ovatis angulato-dentatis basi inæqualibus glabris, fructibus ovatis erectis spinosis.

Datura Tatula. *Mill. Dict. n.* 2. *Willd. Sp. Pl.* i. *p.* 1008. *R. et Sch.* l. c. *p.* 305. *Spr. S. V.* i. *p.* 627. *n.* 8. *Mossl. Man. cur. Reichenb.* i. *p.* 316. *Pursh, Fl. Amer.* i. *p.* 141. Vidi in Herb. Heyn. (cum exemplis *Daturæ ferocis* commixta exempla).

Obs. Viri clariss. Mertens et Koch (*Fl. Germ.* ii. *p.* 223.) et Roth (*Enum. Pl. Phan. Germ.* i. *p.* 656.) Daturam Tatulam varietatem *D. Stramonii* declaravere; perperam puto. Ipse enim jam per triginta annos colui plantam, semper sibi constantem, neque unquam *Daturæ Stramonii* similem filiam e semine procreantem. Notæ differentiales sunt: Caulis major, magis ramosus et divaricatus; folia basi cordata, neque cuneata, saturatioris coloris; flos major, cœruleus, nec albidus (qualis in *D. Stramonio*).

VII. Nicotiana. *Linn.*

Calyx tubulosus, quinquefidus. *Corolla* infundibuliformis vel hypocrateriformis, limbo quinquefido. *Stigma* capitatum. *Capsula* bilocularis, apice quadrifariam dehiscens, polysperma.

Nicotiana Tabacum. Linn. (Wall. Catal. n. 2645. Suppl. n. 228.)

N. caule herbaceo, foliis sessilibus (inferioribus decurrentibus) oblongo-lanceolatis acuminatis, corolla fauce inflato-ventricosa, limbi laciniis acuminatis. *Lehm. Nicot. p.* 21.

Varietas foliis ratione longitudinis latioribus minus acuminatis, inferioribus hinc inde subrepandis vel una alterave serratura præditis, floribus angustioribus limbo minore, colitur prope Katmandu in Nepalia. Culta juxta ripam Saluen flum. in Martabania. Species Tabaci optima! (*Guil. Gomez* 1826). Wall. Catal. Suppl. n. 274.

Obs. An hæc vera *Nicotiana fruticosa* Lour. Cochinch. i. p. 136., quam vulgo Nicotianæ chinensi hortorum adscribunt? Hæc autem *N. fruticosæ* similis foliisque petiolatis, *i.e.* basi valde contracta nudaque adfixis, satis differt. Loureiro, phrasin Linnæanam *N. fruticosæ*, ut solebat, repetens, in describenda planta folia, quæ in diagnosi subpetiolata dicebantur, expressis verbis "subsessilia, semiamplexicaulia, lato-lanceolata, undulata," cet. perhibet. Vereor itaque, ne, diagnosi decepti, recentiores aliam speciem *chinensem* appellave-

rint, quæ fortasse *N. fruticosæ* varietas. Notandum, tamen, omnes fere *Nicotianæ* species, dum cultæ serventur, suffruticosas evadere, basique in lignum durescere.

"*Habitat* ubique culta in Cochinchina et China, ubi vernaculis vocibus nominatur, tanquam indigena, nec ex America translatam fuisse suspicantur." *Loureiro* l. c. *p.* 137.

Conf. *Rumph. Herb. Amboin.* v. *p.* 224. *sqq.* "Sinenses Tabacum vocant *Hun* dicuntque antiquis jam temporibus in sua patria fuisse," cet.

Nicotianam chinensem "foliis petiolatis" in Java insula coli docet cl. Blume, *Bydr. p.* 706.

VIII. Hyoscyamus. *Linn.*

Calyx tubulosus, quinquefidus, persistens, basi ventricosus. *Corolla* campanulato-infundibuliformis limbo subobliquo quinquefido laciniis obtusis, quarum una reliquis major. *Filamenta* inclinata. *Capsula* calyci immersa, bilocularis polysperma operculata!

Hyoscyamus niger. Linn.

H. foliis sessilibus semidecurrentibus amplexicaulibus sinuatis viscido-pilolosis, floribus subsessilibus.

β. *agrestis* Kit.: radice annua, foliis glabriusculis, floribus minoribus. *Schult. Fl. Austr. ed.* 2. *p.* 383. *R. et Sch. S. V.* iv. *p.* 308. *Mert. et Koch, Fl. Germ.* ii. *p.* 225. *Mossl. Handb. ed. Reichenb.* i. *p.* 318.

Hyoscyamus niger. *Roxb. Fl. Ind.* ii. *p.* 237. *Wall. Catal. n.* 2636.

Inter Futtehgur et Delia occidentem versus (*Hardwicke*); in Sasseram (*Herb. Hamilt.*). E seminibus ab illustriss. Marchionissa ab Hastings e Moradabad missis in Horto Calcuttensi cultus est atque medicum in usum conversus.

Adnot. Exempla nostra omnino congruunt cum iis, quæ variis e locis nomine *Hyoscyami agrestis,* floribus reticulatis præditi, accepimus. Folia floralia in hisce sæpe non minus, quam in *H. nigro,* angulato-dentata. Radicem biennem genuino Hyoscyamo nigro tribuunt, quod quidem pro sationis tempore in utroque varium.

VERBASCINÆ.

Solanearum genn. *Juss.* Solanearum tribus III.: Verbasceæ *Lindl.* Scrofularinarum trib. A.: Verbasceæ *Bartl. Reichenb.* Conf. *Rob. Brown, Prodr. Fl. Nov. Holl.* i. *p.* 444. *ed. N. ab E. p.* 300.

Corolla vel rotata limbo plano quinquefido inæquali, vel ventricosa limbo bilabiato. *Stamina* quinque, diversiformia, quorum summum in aliis sterile vel deficiens. *Antheræ* unilocellatæ, connectivo securiformi adnatæ. *Carpella* duo in capsulam coalita bilocularem ab apice dehiscentem. *Endocarpium* in dissepimentum bipartibile transiens. *Trophospermia* marginalia carpellorum in columnam centralem a margine solubilem, axin dissepimenti constituentem, connata, in cavum utriusque carpelli parum prominula. *Semina* multa, reniformia, albuminosa. *Embryo* subarcuatus, centralis.

Folia vel alterna, sæpe decurrentia, vel opposita, in caule stricto aut virgato. *Flores* in racemum terminalem, sæpe elongatum, spicamve dispositi, foliis bractealibus decrescentibus suffulti, albi, lutei vel purpurei. *Filamenta* sæpe barbata.—Substantia mucilaginosa. Herbæ biennes vel perennes.

Antheris ad speciem unilocellatis, reniformibus vel oblongis, vel etiam infracto-complicatis, in eodem flore sæpe inæqualibus et diversiformibus hæc familia a Solanaceis differt, iisdemque et a Scrofularinis recedit, quæ quidem in posterum alio nomine appellandæ, cum Scrofulariæ genus ipsum Verbascinarum familiæ accedat.

Folia inferiora in Verbasco genere divergentia, $\frac{3}{8}$ posita, sæpe per paria sibi propius accedunt. In aliis generibus vere opposita decussantur.

Quod ad antheras attinet, situ proprio in filamenti apice oblique dilatato-rotundatoque hæ distinguuntur, quo fit, ut arcum constituant vel, quemadmodum in Hemimeri, quasi in angulum flexæ conspiciantur. Re quidem vera autem istæ non sunt unilocellatæ, sed locellis adeo contiguis præditæ, ut commune dissepimentum ex utroque pariete conjuncto ortum intercedere videatur, a quo soluta pars exterior folliculi hinc et inde latius dehiscit et in quibusdam omnino reflectitur.

I. Verbascum. *Linn.*

Calyx quinquepartitus. *Corolla* rotata vel subinfundibuliformis. *Stamina* antherigera quinque inclinata sæpe barbata. *Antheræ* vel omnes vel quædam saltem in eodem flore lunatæ.

1. *Verbascum Thapsus.* Linn.

V. foliis decurrentibus lanceolato-oblongis subcrenulatis planis tomentosis, racemo spicato denso, sepalis lanceolatis acutis tomentosis fructum subæquantibus, corollæ subrotatæ laciniis oblongo-obovatis obtusis, antheris subæqualibus.

Verbascum Thapsus. *Linn. Sp. Pl.* i. *p.* 252. *Schrad. Monogr.* i. *p.* 17. *R. et Sch. S. V.* iv. *p.* 325. *Mert. et Koch, Fl. Germ.* ii. *p.* 204.

Verbascum pallidum. *N. ab E. in Flora,* ii. 1. *p.* 295.

Verbascum indicum. *Wall. Catal. n.* 2630, B. C. et F. (promiscue).

Ad Gossain Than in Emodi jugis legit cl. Wallich, cum *Verbasco indico,* coluitque etiam in Horto Calcuttensi. Exempla indica nostratibus maxime congrua sunt, neque ullo modo distinguenda. Culta etiam conveniunt. In Kamoon etiam lectum est. (*R. Blinkworth.*)

Filamenta duo longiora, non minus ac in *Verbasco indico,* glabra sunt. Differt ab hoc (*V. indico*) primo adspectu tomento breviori nec lanuginoso, foliis angustioribus obsolete crenatis breviacutatis, spica angustiori, tomentosa nec lanata, . . . floribus fructibusque minoribus, cet.

Adnot. Verbascum Thapsus Roxb. (in *Fl. Ind.* descriptum) et hoc et *V. indicum* amplectitur.

Variat calycis laciniis nonnullis latioribus tri- vel bi-fidis.

2. *Verbascum indicum.* Wall.

V. foliis decurrentibus elliptico-oblongis crenatis undulatis tomentoso-lanatis, racemo spicato denso, bracteis calycibusque lanatis cuspidatis fructu longioribus, corollæ subrotatæ laciniis subrotundis, antheris subæqualibus.

Verbascum indicum. *Wall. in Roxb. Fl. Ind.* ii. *p.* 236. *Catal. n.* 2630, A. et D., B. C. ex parte.

Verbascum Thapsus. *Roxb. Fl. Ind.* l. c.

Habitat in Emodo monte ad Gossain Than et in sterilibus maximeque expositis locis Ek-dunta inter Koola-Kana et Bheempedi Napaliæ (*Wall.*). In Horto Botanico Calcuttensi cultum perstitit.

Species, sane simillima *Verbasco Thapso* nostrati, sed certo distincta.

Obs. Verbascum Thapsus iisdem in locis observatum est, nostrati plane congruum.

3. *Verbascum,* species dubia.

Adest exemplum in Deyra Dhoon a. 1825 lectum, (*Wall. Catal. n.* 2630, E.) quod quidem ad aliam speciem, caule ramoso, foliisque ovatis parum decurrentibus crenulatis viridibus laxe tomentosis differens; sed flores desunt et folia inferiora, ut ideo nec definiri queat neque certi quid de eo sit statuendum.

Calycis sepala lanceolata sunt.

II. CELSIA.

Calyx quinquepartitus. *Corolla* rotata. *Stamina* perfecta quatuor, didynama, barbata. *Antheræ* lunatæ.

1. *Celsia coromandelina.* Vahl.

C. cano-villosa, foliis inferioribus lyratis, floralibus cordatis semiamplexicaulibus, pedunculis calyce triplo longioribus, laciniis calycis ovatis subserratis.

Celsia coromandelina. *Vahl, Symb.* iii. *p.* 79. (*Degr.*) *Link, Enum. Hort. Berol.* ii. *p.* 145. *n.* 1651. *Wall. Catal. n.* 2631, B.

Habitat in India Orientali. Vidi exemplum in Horto Calcuttensi cultum. ☉. E Munghir, Herb. Hamilt. Wall. Catal. Suppl. n. 245. Ex Herb. Roxb. Wall. l. c. n. 209. Ex Herb. Madr. ("*C. coromandelina, Arcturus,* Vahl."). Wall. l. c. n. 200. Ad ripas Irawaddi flum. (*Guil. Gomez*). Wall. l. c. n. 275. Herb. Wight.

β. *heterophylla.* Pers. Synops. ii. p. 161. n. 5.—E Kumargony, Herb. Hamilt. Wall. Catal. l. c. n. 244.

Adnot. 1. Diversam putamus a *Celsia viscosa* Roth.

Adnot. 2. In describenda *Celsia coromandelina* b. Vahlius "pedunculos bracteis duplo longiores" perhibet, quos breviores illis in definitione posuerat. Addit autem alia, quæ ad *Celsiam viscosam* spectare videantur, v. c. *C. creticæ* similitudinem et calycis lacinias lineares. Suspicor ideo, descriptionem illam ex adversariis diversis, diverso tempore conscriptis, ut fieri solet, compositam esse.

An potius suspicandum, *Celsiam viscosam* culturâ in *C. coromandelinam* abire posse?

Adnot. 3. Cl. Sprengel in Syst. Veg. *Celsiam coromandelinam Celsiæ Arcturo* subjunxit, quod invita natura factum nemo non videt.

2. *Celsia viscosa.* Roth.

C. viscoso-pubescens, foliis caulinis inferioribus lyratis, floralibus cordatis semiamplexicaulibus, pedunculis flori longitudine æqualibus, laciniis calycis oblongo-lanceolatis integerrimis.

Celsia viscosa. *Roth, Catal. Bot. fasc.* ii. *p.* 69. *n.* 4. *fasc.* iii. *p.* 50. *Link, Enum.* ii. *p.* 146. *n.* 1653. *Spr. S. V.* ii. *p.* 809. *n.* 4.

Celsia coromandelina. *Vahl, Symb.* iii. *p.* 79. (*Diagn.*) *Willd. Sp. Pl.* iii. 1. *p.* 280. (*Diagn.*) *Wall. Catal. n.* 2631, A.

Crescit in India Orientali: in Tanjore (*Herb. Wight.*). ⊙.

Adnot. 1. Pedicellis brevibus approximatis et viscositate insignis species, quam cl. Roth l. c. optime exposuit. Etiam in hortis nostris perstat, neque vero simile nobis videtur, plantas Horti Calcuttensis (*Wall. Catal. n.* 2631, B.), ad veram *Celsiam coromandelinam* spectantes, e semine exempli Wightiani, vel ei similis, esse progenitas. *Descriptionem* suam cl. Vahlius ad posterioris hujus speciei exemplum composuisse videtur, quo factum est, ut postea ipse cl. Rothius *viscosam* suam *coromandelinæ* synonymon declararet.

Adnot. 2. Exemplum Herb. Wightiani monstrosam exhibet plantam, racemo florum composito e ramulis unifloris basi foliolosis longitudine pedunculorum, ita ut hi in ramulos mutati esse videantur.

III. Isanthera.

Polygama.

☿. *Calyx* quinquefidus. *Corolla* rotata. *Stamina* quinque, æqualia, recta, glabra. *Antheræ* reniformes, unilocellatæ, rima verticali longitudinali dehiscentes, connectivum semicirculare amplectentes. *Stigma* truncatum. *Capsula* bilocularis, polysperma. *Semina* receptaculis quatuor lamelliformibus inserta, parva.

♀. *Corolla* nulla. *Pistillum* ut in hermaphrodito. *Staminum* rudimenta tuberculiformia.

1. *Isanthera permollis.* N. ab E.

Herb. Heyn., Wall. Catal. Suppl. n. 215. Patria non indicata.

Mollissime ferrugineo-lanata. *Folia* alterna, obovato-cuneiformia, acuta, in petiolum attenuata, costato-penninervia, laxa, supra viridia lanugine sparsa, subtus lanuginoso-albicantia nervo costisque ferrugineo-lanatis. *Flores* in foliorum axillis fasciculato-glomerati, nutantes. *Calyx* extus valde lanatus. *Corolla* calyce brevior, glabra. *Ovarium* e duobus carpellis constat, quæ utrinque ad axin communem inflexi dissepimentum conficiunt bilamellatum, dein rursus peripheriam versus diagonali directione recurrenti margineque ovuliferæ, fere ut in *Gesneriaceis,* in receptaculum seminum lamella stipitatum, transeunt. Semina matura non inveni.

Caulis est erectus, medulla ampla alba farctus. *Cortex* tenuis, spongiosus candidus, detergibilis, dense ferrugineo-lanatus, subtomentosus. *Pubescentia* simplex.

VII. *On the* Lycium *of Dioscorides. By* JOHN FORBES ROYLE, *Esq., F.L.S., late Superintendant of the Hon. East India Company's Botanic Garden at Saharunpore.*

Read January 15th, and February 5th, 1833.

THE identification of the plants which constituted the Materia Medica of the Greeks has so long been a subject of interesting research to the most able naturalists, that any attempt to define what they have left undetermined, or to discover what has eluded their researches, and, still more, to differ in opinion, when they seem most clearly to have elucidated a doubtful point, may seem to many an act of presumption. But this will not appear so, when it is considered that the Materia Medica of the ancients, like that of the present day, was supplied by a variety of countries; and that it is only as these have been investigated by naturalists that the plants which afford medicinal articles have been ascertained: and as some countries still remain unexplored, the plants which yield us valuable substances, such as myrrh, in use from the most ancient to the present times, still remain undiscovered.

The success which has attended the investigations of Clusius, Kæmpfer, Tournefort and Sibthorp, who, to a knowledge of Botany, added that of the authors who have written on the Materia Medica of the Greeks, and then travelled in the countries where the same plants continue to be produced, encourages further inquiries in other countries, whence many articles are said to have been brought to the Greeks and Romans.

India is one of the most remote of these countries, and that which has been within a few years so much investigated as to allow of a very good idea being formed of at least its vegetable productions. Little, however, has yet been done with respect to its Materia Medica; but from the success which attended the efforts of Sir William Jones and Mr. Colebrooke in making out some of the plants affording medicinal articles, much may be hoped from the attention of others being directed to the same interesting field of inquiry. Having been

favourably situated in the north-western provinces of India for carrying on such investigations, I offer the following as an attempt to trace out one of the articles mentioned by Dioscorides as procured from India.

The *Lycium*, *λυκιον*, of Dioscorides is one of those articles of the ancient Materia Medica which still remains undetermined, owing in some measure to its not being at present employed in European practice, and also to Dioscorides having described two different kinds under the above name, one the produce of Lycia and Cappadocia, and the other of India. The former, he says, is by some called *Pyxacantha*, *πυξακανθα*, and is a thorny shrub, with branches of three cubits or more in length; leaves like box thickly set, full of fruit like pepper, black, light and bitter; bark pale-coloured; roots numerous, crooked, woody; and that it grows in stony places. The mode of making the medicinal article is then described, and is that universally employed for making vegetable extracts. The bruised roots and branches being macerated for some days in water, the liquor is strained, and boiled until it becomes of the consistence of honey. The Indian kind, Dioscorides says, is more valuable and efficacious as a medicine; and he adds, that it is said to be made from a shrub called *Lonchitis*, *λογχιτις*, which is thorny, and has branches three or more cubits in length, thicker than those of *Rubus*, with numerous roots; that the bark, when bruised, becomes of a reddish colour, and that the leaves are like those of the olive. That a considerable degree of uncertainty still prevails respecting the plant or plants alluded to in the above descriptions will be evident, if we refer to the latest authors who have noticed the subject.

In the *Dictionnaire Universel de Matière Médicale* of Merat and De Lens (1832), where the opinions of some previous authors are given under the article "*Lycium*," the authors conclude with saying, "Aujourd'hui on ne connaît plus cette composition," and do not hint at the plant producing it. In Rees's Cyclopædia, the author of the article under that name says, "*Lycium*, *λυκιον*, of Dioscorides, so called from Lycia, where it is said to have been abundant, but what was the precise plant has never been settled by commentators:" while under the article "*Rhamnus infectoria*, frequent in rough stony places in Greece," apparently the same author observes, "rightly considered by Dr. Sibthorp as the *λυκιον*, *Lycium*, of Dioscorides." Sprengel, in *Historia Rei Her-*

bariæ, vol. i. p. 162, quotes Rauwolf and Hasselquist as authorities for considering *Lycium europæum* as the λυκιον of Dioscorides, though he alludes to the opinion of Prosper Alpinus, that *Berberis cretica* was the plant, but that he had not obtained any of the juice from it. In the same work, at page 191, Sprengel, in conformity with the opinion of Garcias ab Orto, gives *Acacia Catechu* as the plant yielding the λυκιον ινδικον of Dioscorides.

From the above references it is evident that the subject does not appear to have been so satisfactorily settled as to render further investigation unnecessary; but it is expedient, before proceeding in our inquiry, to refer to the authors who have treated expressly on the subject.

In Matthiolus's Commentaries on Dioscorides, (edition of 1698, by Caspar Bauhin,) figures of three plants are given, which he thinks may be those yielding *Lycium.* The first, called simply *Lycium,* appears to be *Rhamnus catharticus*; the second, called *Lycium italicum,* may be *Rhamnus infectorius*; and the third is *Buxus sempervirens.*

Garcias ab Orto in *Clusii Exot.* lib. i. cap. 10. p. 163., after describing the mode of making Catechu from the wood of *Acacia Catechu,* which, he says, is called *Hacchic,* adds: "Nunc superest, fuerit ne *Cate* veteribus cognitum, examineremus. Ego si mihi dicere licet quod sentio, omninò existimo nostrum hoc *Cate* nihil aliud esse, quàm Græcorum et Latinorum Lycium. Nam ejus extrahendi ratio ab omnibus eadem describitur, iisdemque facultatibus pollere censetur quibus nostrum *Cate.* Huc, adde, quòd Indicum Lycium præfertur cum à Dioscoride, Plinio, tum à Galeno. Vocatum autem est à Græcis Lycium, quoniam in Lycia primùm inter Græcos illius usus repertus sit, optimumque istic nasci eo tempore censerent. Præfertur etiam Indicum Avicennæ et Serapioni, qui id *Hadhadh* appellant, easdemque illi facultates tribuunt, quas Græci et Latini. Avicenna vult in ejus penuria Arecam et Santalum substitui." To this Clusius adds, "Dioscoridi Lycium folia Buxi habet, et pusilla est arbor. Itaque longè alia censenda est quàm ea quæ nostro auctori describitur." I do not think that this would be considered an insuperable objection, as it is not to be supposed that Dioscorides ever saw the plant affording the Indian *Lycium*; indeed, he expressly says, "it is related, that a plant with leaves like the olive, &c., yields the Indian Lycium." From the foregoing extract it appears that Garcias ab Orto considered *Catechu* to be *Lycium,* because both are similarly

made, both possess nearly similar properties, and both are Indian products, and because the Indian *Lycium* was always preferred by ancient practitioners. But I have never seen in any of the Persian works on Materia Medica, which are derived from the Arabic, the name *Hadhadh,* or *Hacchic,* applied to Catechu, though, as will afterwards abundantly appear, it is to *Lycium.* Rauwolf, in his Itinerary, p. 485, mentions *Lycium* as "a plant with small branches, which still retains its name among our apothecaries, called by King David, in the 58th Psalm, by its Hebrew name *Hadhadh,* by which it is still known among the Arabs, the two languages being nearly related." The plant figured is by Sprengel called *Lycium europæum*; it may be a species of *Rhamnus.* Prosper Alpinus, in his work *De Plantis Ægypti,* lib. i. cap. xi. & xii., describes and figures two plants, which he supposes may be the *Lycium* of Dioscorides; the first, he says, is called *Agihalid,* though a tree, but has leaves like Box, and is used in medicine. This is said by Sprengel (vol. i. p. 383.) to be the *Rhamnus divaricatus* of Forsköl, though I do not find this enumerated among either the species or synonyms of *Rhamnus.* The plant represented is known to be *Balanites ægyptiaca,* the *Ximenia ægyptiaca* of Linnæus. The second plant, which he considers may be *Lycium,* is called *Uzez,* and is referred to *Lycium europæum* by Sprengel. Both of these plants are supposed by Prosper Alpinus, without, however, his adducing any proofs, to be the *Lycium* of Dioscorides. Hasselquist found *Lycium europæum* in Egypt beyond Cairo, near the banks of the Nile. It is common in hedges in Greece, and was identified by Dr. Sibthorp as being the ῥαμνος of Dioscorides, as it still retains the same name. Prosper Alpinus, in his subsequent work, *De Plantis Exoticis,* referring to his former opinions, gives a description and figure of *Berberis cretica,* which he considers to be the true *Lycium* of Dioscorides. This he describes as "spinis horrens, foliis buxi, baccæ oblongæ, nigrescentes, piperis magnitudine et rotunditate, sapore stiptico, primò subdulci, post amarescente;" adding, "quod pertinet ad istius plantæ facultates, atque ad usus medicos proculdubio habebit et hæc planta easdem, et vires et usus quos antiqui de *Lycio* tradiderunt;" but that he is ignorant whether any extract like *Lycium* is obtained from the roots or branches of this plant. Sir James E. Smith, in the *Flora Græca,* tab. 342., under *Berberis cretica,* (Cretan or Box-leaved Barberry,) quotes this synonym of Alpinus as well as that of Pona, who calls it "*Licio di Candia,*"

and of Tournefort, "*Berberis cretica buxifolia*"; but does not refer to any of them under the articles "*Lycium*" and "*Rhamnus infectoria*".

In the quotation made from Rees's Cyclopædia, stating Dr. Sibthorp's opinion that *Rhamnus infectorius* is the *Lycium* of Dioscorides, the reasons not having been stated for the Doctor entertaining this opinion, I applied to Professor Lindley for some information on the subject, and he has kindly favoured me with the following extract from Dr. Sibthorp's manuscripts.

"84. *λυκιον*. Probably the *Rhamnus oleoides**, which agrees very well with the description of Dioscorides. Frequent in the island of Milo and other parts of Greece. The wood of this tree is a valuable article of commerce, and is exported to England for the use of the dyers under the name of *Fustick*: the Greeks call the wood *χρυσοξυλον*, from its dyeing a golden or yellow colour. Dioscorides describes the manner in which the expressed juice was drawn from the roots, the stem and the fruit. Besides its medical uses, it was used by the Greeks for dyeing the hair yellow."

In addition to this it may be added, as stated in Rees's Cyclopædia, that the unripe berries are much used for dyeing, and are imported in great quantities into England under the name Turkey berries, or *graine d'Avignon*, being used for giving the yellow colours to Morocco leather. It is worthy of remark, also, that one species of *Rhamnus* is called *R. lycioides*, or Box-thorn Rhamnus, and that several species are possessed of medicinal powers, and others are used for their colouring properties, as *Rhamnus catharticus*, more generally known as a purgative, under the form of Syrup of Buckthorn: the juice of its unripe berries has the colour of saffron, and is used for staining paper. The inner bark and berries of *R. Frangula* are also purgative, and, according to their ripeness, are employed for dyeing yellow, green, or blue.

It is not improbable, therefore, that if not *infectorius*, some other species of the genus *Rhamnus* may have been employed as *Lycium*, though we have no proof that that extract had ever been obtained from any of them, as related by Dioscorides; but the roots, stems and berries of *R. infectorius* possessing medicinal and colouring properties, and being common in the countries where one kind of *Lycium* is said to have been produced, and species of *Rhamnus*

* *infectorius* (potiùs).—Note in Sir J. E. Smith's writing.

having been by the older botanists called *Lycium*, are certainly in favour of its being the plant yielding one kind of *Lycium*.

It is remarkable, however, that the genus *Berberis*, of which one species, as before mentioned, was supposed by Prosper Alpinus to be *Lycium*, possesses so many of the same properties as some species of the genus *Rhamnus*. *Spina Appendix*, *Oxyacanthos*, *Amyrberis* and *Crespinus* are the names given to the common Barberry by Pliny, Galen, Avicenna and Matthiolus. The fruit is a mild astringent acid; the leaves have similar properties, but in a less degree. The young bark is said to be purgative, and was formerly given in jaundice. The bark and wood, both of the stem and root, are yellow, bitter and styptic, and have been employed as astringents. The root contains a yellow colouring matter, sufficiently abundant* to be employed for dyeing flax, cotton and wool, and to give a lustre to prepared leather. It is found also in every part of Europe, and in the western parts of Asia, from Portugal to Georgia, and from Crete to Norway, occurring in the plains in northern latitudes, and on mountains in the south, as on Lebanon. Its geographical distribution, therefore, is not incompatible with that of *Lycium*, while *Berberis cretica* is chiefly found in the islands: one species is moreover called *Berberis buxifolia*. It is singular that a plant so remarkable as the Barberry for its conspicuous flowers, peculiar odour, acid fruit and leaves, thorny nature, and yellow wood, should not be noticed by Dioscorides, if it was then, as now, an inhabitant of the same localities. It may, perhaps, be more than an accidental coincidence, that the old English name of Barberry is *Pepperidge-bush*, and that the fruit of *Lycium* is compared by Dioscorides to that of *πέπερι*, which is always translated 'pepper'.

From everything that has been yet adduced, it is evident that considerable uncertainty still prevails respecting the plant producing the *Lycium* of Asia Minor, while that which afforded the original and most efficacious kind imported from India has hardly been hinted at; for the opinion of Garcias ab Orto that *Acacia Catechu* was the plant, is unsupported by any proof, and is incompatible with the writings of Oriental authors to be afterwards adduced. If we suppose that the same plant produced the *Lycium* of India and of Lycia,

* *Vide* analysis by Brande, *Bulletin des Sciences Médicales* de Férussac, tom. vi. p. 186. Vauquelin has further proved, that few woods are superior to that of *Berberis tinctoria*, a variety of *B. asiatica*, for dyeing yellow.

it is evident that the *Acacia Catechu* is not that plant, for it does not extend beyond India; and though *Rhamnus infectorius* may have produced one kind of *Lycium*, it is a plant which does not exist in India: but from the Barberry possessing so many of the same properties, being used for the same purposes, and occurring in the same countries, it appears to me as likely as any other to have been the true *Lycium*. But if it be required that species of the same genus should have produced the two kinds of *Lycium*, it will not be difficult to find one, of which species are indigenous both in India and Asia Minor, possessing all the requisite characters, and from which an extract is even at the present day prepared, answering in every respect to the *Lycium* of Dioscorides.

It is well known that the knowledge of Grecian medicine was transferred to the Arabians by means of translations made at Bagdad in the caliphates of Al-Mansor, Harroon-Al-Raschid, and especially of Al-Mamoon; and among the first works translated were those of Pliny, Galen and Dioscorides. The Persians have translated from the Arabic into their own language, and their works are now the text-books of all the Mahommedan students and practitioners of medicine throughout India: we may expect, therefore, to find some traces of *Lycium* in the portion of these works which treats of Materia Medica.

In the Index to the *Mukhzun-ool-Udwieh* (or Storehouse of Medicines), I find لوفيون, *loofyon*, mentioned as the plant which yields *hūziz*, and that in Persian it is called *feel-zuhreh*. In referring, in the body of the work, to the account of *hūziz*, *loofyon* is said to be its Greek name. This must evidently be intended for *lookyon*, particularly if we attend to the context, which corresponds with the description of Dioscorides; and this there is no difficulty in conceiving, for the letters *f* and *k* in composition are similarly written in the Arabic alphabet, and differ only in the latter having two, and the former only one diacritical point placed over it; thus, لوقيون, *lookyon*, may easily, by an error of the transcriber, be converted into لوفيون, *loofyon*, as has been done, to adduce a familiar instance, in the name of Antiochus, the first of Alexander's successors who reigned in Persia, from *Antakhash* into *Abtakhash*; فيلفوس, *Filafoos*, Philip of Macedon, into فيلقوس, *Filakoos*.

Hoozuz, or *hooziz*, is further described as being of two kinds; one from India of which the Hindee name is *rusot*, and the other from Arabia; that the Greek name is *loofion*; the Persian *feel-zuhreh*, which in Hindee is also called

rusunjun; and that this kind, in the language of Misr, or Egypt, is called *kholan.* The Persian name *feel-zuhreh* is translated in our best Persian and Arabic Dictionary *Box-thorn,* the literal translation of πυξακανθα. The Persian, being compounded of two words, *feel,* an elephant, and *zuhr,* a yellow flower, may refer to the brightness or conspicuous nature of the flower, in the same way that a turkey is called *feel-moorgh,* the elephant-fowl.

The description appended to the synonyms of *hooziz* is evidently a translation of that of the λυκιον of Dioscorides, as it is said to be "an extract of the leaves and seed of a thorny plant, about three cubits in height, of which the leaves are like those of box, and the fruit like that of black pepper," &c. The mode of manufacturing it is then described, as well as the composition of an adulterated kind, which for many purposes must be superior as a medicine to the original article, being composed of myrrh, aloes, saffron, syrup and decoction of myrtle-leaves, nearly as the present Pilulæ Aloes cum Myrrha are made. This will explain a passage in all accounts of *Lycium,* in which one kind is said to have been inflammable, and the other not so; though the Persian writers appear to have reversed the matter, in making the vegetable extract inflammable, and the resinous compound not so.

The author of the *Mukhzun-ool-Udwieh,* in an article on the Indian *hooziz,* mentions that the best kind came from Nuggur-kote, in the neighbourhood of Lahore, and was supposed to be made from the fresh juice of *Myrobolans.* To this it may be objected, that as species of *Terminalia* are found all over India, it is not likely that an article so much in use should only be manufactured in the neighbourhood of a hill-fort, which it is known serves as a commercial entrepôt for exchanging the produce of the hills with that of the plains. The same author then alludes to another writer, who mentions having obtained his information from a Hindoo physician of repute, that *rusot* is the inspissated extract made from a decoction of the fresh wood of *dar-huld,* or the *turmeric-coloured wood.*

The Sanscrit and Hindee name *dar-huld* is called *zur-chob* and *zurd-chob* in Persian, and in Arabic has a name signifying "the *turmeric-coloured root*: it is said to be an Indian tree, of which the wood is yellow, and from which *rusot* is said to be made.

On inquiring in the shops of the druggists in the bazars of India, I everywhere learnt that both the wood *dar-huld* and the extract *rusot* were im-

ported from the hills into the plains, and that large quantities continued to be brought from Nuggur-kote as well as other places.

While travelling in the Himalayas, I continued my inquiries on the subject, and on wishing to be shown the plant which produced the wood called *dar-huld,* as well as that from which the *rusot* was procured, species of Barberry were immediately pointed out; and I was told that both the wood and the extract were procured indifferently from *Berberis asiatica, B. aristata,* and *B. Lycium,* as well as from *B. pinnata,* the *Mahonia nepalensis* of De Candolle. On cutting into the wood of each, and having some converted into extract, I found both to correspond in every respect with the wood and the extract which I had bought in the plains under the names of *dar-huld* and *rusot.*

As the above plants, (with the exception of *B. Lycium,* for the characters of which the reader is referred to the end of this article,) have been fully described by De Candolle in his *Systema Vegetabilium,* and as *B. asiatica* and *Mahonia nepalensis* are figured in the 1st and 3rd Plates of the 2nd volume of *Icones Selectæ Plantarum* of the Baron De Lessert, and *Berberis aristata* in Plate 98 of Dr. Hooker's Exotic Flora, it is unnecessary to dwell on their botanical characters. It may be interesting, however, to remark, that *B. Lycium* is found as low as 3000 feet, *B. asiatica* grows naturally in 30° of latitude, at elevations of from 5000 to 7000 feet, *B. aristata* at from 5000 to 8000 feet, and *B. pinnata* is prevalent at from 6000 to 7000 feet above the level of the sea; and it may also be observed, that the French traveller Leschenault de la Tour found *Berberis tinctoria,* which is considered in the work of De Lessert to be the same as *Berberis asiatica,* on the Neel-gherris, in 11° of latitude, at 8000 feet of elevation, and that there also it is brought into use. "E ligno corticeque elicitur color luteus, cæteris præstantior." De Candolle, in the Addenda to the 2nd volume of his *Systema Vegetabilium,* describes it as "Lignum flavissimum, amarissimum."

It was observed in a former part of this paper as remarkable that there appeared to be no traces of any description of the Barberry in Dioscorides. I was anxious, therefore, to ascertain if the Arabians and Persians had alluded to it; and I adduce the following curious and good specimen of their mode of describing a plant, of which there do not seem to be any traces in their Greek originals.

The Barberry is called *amburbarees,* as in Avicenna, quoted by De Candolle: its Persian synonyms are *zerishk, zaruj, zurunj, zurak,*—all having reference to its yellow colour,—derived apparently from *zur,* gold, and closely assimilating to *zuhruj,* before referred to under *hooziz.* The bark of the root is called *arghees,* of which the synonyms are in Persian equivalent to "bark of the yellow root," "bark of the root of Barberry." The plant itself is described as being "a thorny plant; that its thorns are triple, that is, wherever they occur, three come out together; an inhabitant of the lower hills in Khorassan and Shirwan, and towards Shiraz, in Syria and in Room (that is, Turkey); but that the kind which is found in Khorassan and Shirwan is preferable on account of the fruit being full of juice and free from seeds; but in the environs of Shiraz it is found full of seeds; and that which grows in lofty and cold places is always the best. Its leaves are like those of *Yasmin,* but longer and narrower: its flowers are yellow, with a shade of white, crowded together near the tops of the branches; fruit oblong, and clustered together; when unripe green, afterwards red, and finally purple. The plant varies in height from two to three fathoms, or is about the size of an apple-tree," &c.

From this description, it is evident that the Barberry was well known to the old Arabian and Persian authors; and though the knowledge of the fact seems to have been lost, I think it is evident they were aware that the Indian *hooziz* was made from the wood *dar-huld* and the plant *zuhruj*: this is more clearly stated by the later authors who had communication with Hindoo physicians. It has been proved that the Indian *hooziz* is *rusot,* and that both it and the wood *dar-huld* are the produce of species of Barberry; that the Greek name *loofyon,* or *lookyon,* is given as a synonym of *hooziz,* followed by the description of *Lycium,* λυκιον, as given in the 133rd chapter of the 1st Book of Dioscorides: we may therefore, I think, safely conclude that the *Indian Lycium* was then, as now, made from the wood and root of species of Barberry. Whether the Arabian *hooziz* was the produce of a distinct plant, or only an artificial compound of myrrh, aloes and saffron, does not so clearly appear. The *Lycium* of Asia Minor may have been made from different species of *Rhamnus,* or from *Rhamnus infectorius* only; but it may also have been made from *Berberis vulgaris,* as formerly inferred.

In conclusion, it remains only to add, that the *rusot* is at the present day

procurable in every bazar in India, and used by the native practitioners, who are fond of applying it both in incipient and chronic inflammation of the eye, and in the latter state, both simply and in combination with opium and alum. It is sometimes prescribed by European practitioners; and I have heard that it was found very efficacious by Mr. M'Dowell in the ophthalmia of soldiers who had returned from the expedition to Egypt. I have myself occasionally prescribed it; and the native mode of application makes it particularly eligible in cases succeeding acute inflammation, where the eye remains much swollen. The extract is by native practitioners in such cases rubbed to a proper consistence with a little water, sometimes with the addition of opium and alum, and applied in a thick layer over the swollen eyelids; the addition of a little oil I have found preferable, as preventing the too rapid desiccation. Patients generally express themselves as experiencing considerable relief from the application.

I conceive that two species, under *B. aristata*, or at least two such very distinct varieties have been included, as to require particular notice. These are distinguished by the natives, apt to confound things together, by the names *kushmul* and *chitra*. The former growing at low elevations, (as 3000 feet,) and therefore easily acclimated in the plains of India, has the leaves and branches paler-coloured, more thorny; flowers numerous; racemes erect, appearing earlier in the season, and having less pleasant-tasted fruit; while *chitra*, which I conceive to be the true *B. aristata*, I have not found below 5000 feet of elevation, with brownish-coloured branches, smooth, shining, almost entire leaves, each flower much larger than those of *kushmul*, though less numerous, on each of the drooping racemes. The fruit of this species, as well as that of *B. nepalensis*, is dried as raisins are in the sun, and sent down to the plains for sale.

1. *Berberis aristata*, spinis infimis tripartitis superioribus simplicibus compressis basi vix bidentatis, foliis 4—6-fasciculatis viridibus obovatis oblongisve nitidis basi attenuatis integerrimis spinuloso-dentatisve, racemis 15-floris nutantibus folio longioribus, pedicellis sæpe trifidis trifloris, squamulis rotundatis, ovariis subpilosis, baccis oblongis utrinque acutis.

B. aristata. *DeCand. Syst. Veg.* ii. *p.* 8. *Prodr.* i. 108. *Wall. Catal. n.* 1474. ex parte.

B. Chitria. *Don, Prodr. Fl. Nep. p.* 204. *Hooker, Exot. Flora, tab.* 98.

Hab. Jurreepanee to Mussooree and Choor Mountain, 5000 to 8000 feet of elevation; flowers in May. Hill-name *chitra.*

Arab. *amburbarees.* Pers. *zirishk*; wood, *dar-huld* and *dar-chob*; extract *hooziz.* Hind. *rusot.*

2. *B. Lycium,* spinis 3-partitis conicis, foliis 5—8-fasciculatis pallidis coriaceis venosis oblongis lanceolatis v. obovatis basi attenuatis mucronatis, marginibus spinuloso-dentatis v. integris, racemis 20-floris erectis patulis demum (fructiferis) pendulis, pedicellis longis simplicibus, floribus parvis, squamulis lanceolatis, ovariis glabris tetraspermis, baccis ovatis utrinque obtusis.

B. floribunda. *Wall. Catal.* 1474? Kemaon. B. angustifolia. *Roxb. Fl. Ind.* ii. *p.* 183.?

Hab. Rajpore to Mussooree, or from 3000 to 7000 feet of elevation; also from Nahn to Choor: flowers in April. Hill-name *kushmul*, chiefly employed in Gurhwal and Sirmore for making *rusot.*

VIII. *A Review of the Natural Order* Myrsineæ. *By M.* Alphonse De Candolle, *Honorary Professor and one of the Directors of the Botanic Garden at Geneva.*

Read March 5th, and April 16th, 1833.

DURING a visit to England, with the view of assisting Dr. Wallich in the distribution of the great Herbarium given, since that time, by the Honourable East India Company to the Linnean Society, this celebrated botanist did me the honour of entrusting to me the care of describing several new species collected by him, and among others, those belonging to the natural order of *Myrsineæ*. My first intention was, not to extend my researches beyond the Indian species; but I was soon convinced that such an addition to a limited order like this could not be made without reviewing the whole of it, as I had already done in a similar case in the natural order of *Anonaceæ**. It led me, of course, to a better classification. I must confess, however, that doubts still remain as to the precise limits of some genera, on account of the difficulty of ascertaining from dry specimens the number and insertion of the ovula.

This natural order was named by Ventenat *Ophiospermes*, and by some botanists *Ardisiaceæ*; but Mr. Brown, who in a few words in his *Prodromus Floræ Novæ Hollandiæ* threw considerable light on the subject, proposed for it the name of *Myrsineæ*, which has been since generally adopted.

Their place in the very intricate net of affinities is now well established between *Sapoteæ* and *Primulaceæ*, notwithstanding their remarkable analogy with another remote order, that of *Rhamneæ*. Were the relative affinities of plants to be represented upon a sphere, as the position of islands, these different orders would be all under the same degree of latitude, but *Rhamneæ* under a very distant longitude.

Myrsineæ differ from *Sapoteæ* by the constant deficiency of stamens alter-

* "Mémoire sur la Famille des Anonacées, et en particulier sur celles du Pays des Birmans," in the *Mémoires de la Société de Physique et d'Histoire Naturelle de Génève*, vol. v.

nating with the lobes of the corolla, so that, as in *Primulaceæ,* there remain only a number of stamens equal to the lobes of the corolla, and opposite to them. In this respect *Sapoteæ* are but a regular state of *Myrsineæ* and *Primulaceæ.* Without this character of a double or simple verticil of stamens, no positive distinction would remain between these orders, as the direction of the embryo, erect or transverse, has been shown by Mr. Brown to be of no great consequence.

From *Primulaceæ,* the only distinctive character seems to be in the fruit not being dehiscent; the habit of the two orders is besides very different, *Primulaceæ* being herbaceous, and *Myrsineæ* more or less ligneous, sometimes even forming large trees. There may be also some difference in the shape of the grains of pollen. In *Primula grandiflora* they appear under the microscope to be rectangular; in *Primula sinensis* and *Primula Auricula* they are oblong, but with some irregularity, and with a disposition to show sometimes angular extremities and a quadrilateral form. In *Ardisia humilis, anceps, crenulata* and *cubana,* I saw nothing angular in them; but they are ovoid and very obtuse. In both orders they have no asperities by which cohesion takes place. Dr. Martius represents the grains of pollen as really round in *Cybianthus* and *Conomorpha* (*Cyb. laxiflorus,* Mart.); but I suppose they have been observed in water, which makes elliptic grains become round.

Some difficulty arises from the genus *Mœsa* (*Bœobotrys*) having a great number of seeds, as in many *Primulaceæ,* and an inferior ovarium, as in the well-known and anomalous genus *Samolus.* But this last differs more from the true *Primulaceæ* than *Mœsa* does from *Myrsineæ,* because it has five small filaments alternating with the lobes of the corolla, so as to show the natural state of *Primulaceæ* and the constant abortion that prevails in them. When Dr. Bartling constituted a distinct family of *Samolus* and *Mœsa* among his extensive class of *Myrsineæ,* where *Primulaceæ* are also included, he omitted the fact of these five rudiments of stamens existing in *Samolus* and not in *Mœsa.* After all, were *Samolus* an extensive genus, and not limited to a few species only, it would have been considered worthy of forming a distinct order, intermediate, as *Myrsineæ,* between *Sapoteæ* and *Primulaceæ.* At present, the best classification, I suppose, is to include among *Myrsineæ* the tribe of *Mœseæ,* and in *Primulaceæ* that of *Samoleæ.*

I therefore propose to divide the *Myrsineæ* into three tribes: 1st, *Ægicereæ*, with an erect embryo, nearly allied to *Sapoteæ*, and particularly to *Jacquinia*; 2nd, *Ardisieæ*, including the bulk of true *Myrsineæ*; 3rd, *Mæseæ*, with an inferior ovarium, approaching to *Primulaceæ*, and especially to the tribe *Samoleæ*.

Mr. Brown has proposed* to include in the genus *Myrsine* certain species having a divided stigma, and formerly referred to *Ardisia*. I agree with him in removing them from *Ardisia*; but the best character of *Myrsine* consisting in its peculiar inflorescence, and these species not possessing that character, I prefer establishing them as a separate genus, to which I have given the old name of *Badula*.

I have proposed two new genera, namely, *Weigeltia* and *Conomorpha*, the characters of which are well marked. But my genus *Choripetalum* will be considered as a very great exception, and its principal character must still be thoroughly examined. It is composed of two species, which Dr. Wallich describes as polypetalous (see *Flora Indica*, ii.), though the fruit is certainly that of the *Myrsineæ*. Unfortunately, these species are very scarce, and in a bad state in herbaria; and besides, it is not easy to determine whether a corolla be really polypetalous or deeply divided: the best criterion, I believe, is, that distinct petals alone fall off separately, and so I observed them in our specimens; but might not broken lobes in the dry plant assume the same appearance? I hope Dr. Wallich will examine this point again in living specimens, although I expect my genus will remain in any case, as the two species have very much the same habit, and differ in that respect from all others.

The *Myrsineæ* have more or less a disposition to produce a resinous substance, which appears as dots or *reservoirs* in different parts of the plant, chiefly in the leaves, flowers and berries. It may be seen also in the hard wood of *Myrsine* and *Ægiceras*. That this matter is resinous I have little doubt, as I have ascertained that it melts and burns in the flame of a candle: it is not soluble in water, but is so in oil or in alcohol when moderately heated, giving to the latter a rose colour. I observed these facts with the berries of *Myrsine semiserrata*. The dots of *Myrsineæ* are dark or light brown, reddish, orange, or yellow; they vary in size, shape and position, in different species. I sup-

* *Prodr. Fl. Nov. Holl.*, p. 533.

pose the styptic taste of the fruit of *Embelia Ribes* to depend very much upon the quantity, and some peculiar quality, of this resinous substance.

Of 180 species of *Myrsineæ* (besides some that are doubtful), 58 are described for the first time in this paper. They grow commonly on the hilly and mountainous regions of the hottest parts of the globe. None have yet been found beyond the 39th or 40th degree of latitude, viz. in Japan, whilst they abound in Java, and in some parts of India and South America. Mr. Brown (Botany of Congo) remarks, that no species is known in Africa, except at the Cape, and on both sides of that continent, at the Canary Islands and Mauritius, Bourbon and Madagascar. This fact is still true; but as the *Myrsineæ* of hot countries grow chiefly in the mountains, it may happen that many may exist in the higher regions of Congo, Guinea, and Central Africa. The 180 species are distributed as follows: 112 in Asia and New Holland, 48 in America, and 20 in Africa. No species has been observed in two of these extensive divisions of the globe. But if we descend to regions so far limited, as that about 50 may be reckoned for the whole surface of the earth, of which only 43 or 44 have been more or less visited by travellers, we shall find that the genera and species of *Myrsineæ* are distributed as in the following Table.

In the Table, some species have been omitted on account of the difficulty of ascertaining their origin, and 14 are repeated twice or more, because they grow in more than one region. The most *sporadic* or *cosmopolite* species, *Ardisia humilis* of Vahl, is known already in six different regions, viz. Ceylon, Bengal, Nipal, the Birmese kingdom, Cochinchina and the Indian Archipelago. *Ægiceras fragrans* and *Mæsa indica* extend also over four or five regions, which are nearly the same. *Myrsine Rapanea* is found in three regions of America, and ten other species in two regions, not far removed from each other, except in the case of *Myrsine africana,* which appears to grow both at the Cape and in the Azores.

Of 100 species of *Myrsineæ,* nearly 92 are limited to one region. This is a large proportion, as, looking to similar calculations which I have made upon more than 4000 species, founded upon the same distinction of regions, I find only in *Melastomaceæ* and *Myrtaceæ* a greater proportion of *endemic* species (98 per cent.). In *Anonaceæ* it is 90; in *Campanulaceæ,* 84; in the genus *Polygonum,* 76; in *Cruciferæ,* 75; in *Papaveraceæ,* 60, &c.

REGIONS.	Ægiceras.	Wallenia.	Weigeltia.	Conomorpha.	Cybianthus.	Myrsine.	Badula.	Oncostemum.	Ardisia.	Embelia.	Choripetalum.	Mæsa.	Genus incert.	*Total Number.*
Canary Islands and Madera						1			1					2
Azores						1								1
Cape of Good Hope						4								4
Madagascar, Mauritius and Bourbon						1	7	2				1	4	15
Arabia												1		1
Ceylon and Indian Peninsula	1					1			3	2	1	1		9
Bengal	1					1			13	8	1	3		27
Nipal						6			6			4		16
Birmese Dominions and Martaban	1					1			10	3		4		19
Cochinchina						1			2					3
Indian Archipelago (Java, Penang, Singapore)	2					3			28	2		7	5	47
Philippine Islands									2					2
China and Japan									6					6
New Holland and New Zealand	1					4								5
United States of America						1								1
Mexico						1			4					5
Caribbee Islands		1				5			8					14
Venezuela						1			2					3
New Granada and Quito					1	1			3					5
Guiana			1			1			1				1	4
Banks of the Amazon				2										2
Bahia and Pernambuco						1								1
Rio Janeiro and Ilheos					3	1			2				1	7
Peru						8			1					9

In the following paper 58 species of *Myrsineæ* are described, which are either entirely new, or merely enumerated by name in Dr. Wallich's Catalogue. They increase by one third the number of species already known. Of such of the genera and species, to the descriptions already published of which I can add nothing, I merely give the names, and a reference to the authors who first described them. Their enumeration may be useful in showing the affinities of the new species with the old.

MYRSINEÆ.

Ophiosperma. *Vent. Cels. p.* 86.
Myrsineæ. *Brown Prodr. p.* 533.
Ardisiaceæ. *Juss. Ann. du Mus.* xv. *p.* 349.

Charact. *Calyx* persistens, 5-4-lobus. *Corolla* gamopetala (vel rarius polypetala?) regularis, lobis vel petalis numero loborum calycis. *Stamina* tot quot lobi corollæ, eorum basi inserta, iisque opposita, inter se libera vel connata. *Pollen* ovoideo-globosum, læve. *Ovarium* liberum vel adhærens, 1-loculare, ovulis in placentâ centrali immersis. *Stylus* 1. *Drupa* vel *bacca* 1 vel polysperma. *Albumen* corneum, semini conforme, aut deficiens. *Cotyledones* breves. *Plumula* inconspicua vel brevissima.

Veget. Arbores, frutices vel suffrutices, foliis alternis aut rarius suboppositis subverticillatis, simplicibus, integris vel dentatis, floribus axillaribus pedunculatis vel sessilibus, floratione indefinitâ centripetâ. Partes omnes materiâ resinosâ plus minusve donatæ, et ideo variis modis punctatæ et maculatæ. Pili simplices vel stellati, sæpius e cellulis pluribus constantes, nunc brevissimi, in pedunculis, calyce, et paginâ inferiori foliorum frequentiores, in quâque specie sitû formâ numeroque parum variantes.

Hab. Regiones calidiores, præcipue Asiæ et Americæ, usque ad 39um grad. lat. In sylvaticis montosis frequentiores.

Affin. Ordo medius inter Sapoteas, ubi Jacquinia propius sistit, et Primulaceas, ubi Samolus. A Sapoteis differt abortione verticilli staminum lobis corollæ alterni, a Primulaceis fructû indehiscente et habitû. Cum Rhamneis analogia tantum.

Tribus I. ÆGICEREÆ.

Char. *Calyx* 5-partitus, foliolis oblique imbricatis. *Corolla* 5-fida. *Filamenta* basi connata. *Antheræ* liberæ, sagittatæ, loculis longitudinaliter dehiscentibus, parietibus transversis intersectis. *Ovarium* superum, polyspermum. *Stigma* simplex. *Drupa* elongata, cylindracea, follicularis, monosperma. *Albumen* 0. *Embryo* erectus.

Veget. Habitus Sapotearum.

I. Ægiceras.

Ægiceras. *Gærtn. Kœn. Ann. of Bot.* i. *p.* 129. *Brown Prodr. p.* 534.

Species.

1. Æ. fragrans *Kœn.* Æ. majus *Gærtn.* Æ. obovatum *Blum.* Æ. floridum *Rœm. et Schult.* In maritimis Novæ Hollandiæ (*Brown! Sieb.! n.* 518.), Moluccarum (*Rumph.*), Javæ (*Blum.*), regni Burmanici (*Wall.!*), insulæ Penang (*Wall.!*), Deltæ Gangis (*Wall.!*), Malabariæ (*Kœn.*).
2. Æ. ferreum. *Blum.*

Tribus II. ARDISIEÆ.

Char. *Calyx* 4-5-lobus. *Corolla* gamopetala. *Stamina* sæpius libera, loculis longitudinaliter aut apice dehiscentibus. *Ovarium* superum, polyspermum. *Drupa* seu *bacca* globosa, monosperma. *Albumen* corneum. *Embryo* transversus.

II. Wallenia.

Wallenia. *Sw. Prodr.* i. *p.* 31.

Char. *Calyx* et *corollà* tubulosi, apice 4-lobi. *Stamina* 4, imæ basi corollæ inserta: *filamenta* inter se basi connata, superne libera et exserta: *antheræ* ovoideæ, filamentis multo breviores cito effœtæ et horizontales, loculis longitudinaliter dehiscentibus. *Stylus* brevis. *Stigma* punctiforme.

Veget. Arbusculæ, foliis alternis vel suboppositis subternatisve, oblongis, plus minusve obtusis, integris, coriaceis, glabris; paniculis terminalibus, nudis, multifloris; pedicellis apice pedunculorum subumbellatis. Lobi calycis et corollæ obtusi, æstivatione imbricatâ, in calyce tamen lobo uno exteriore, aliis vere imbricatis. Filamenta polline emisso accrescentia.

Species.

1. W. laurifolia (*Sw.! Prodr. p.* 31. *Fl. Ind. Occ.* i. *p.* 248. *t.* 6.), calyce et corollâ glanduloso-punctatis. In Jamaicâ (*Sw.!*), Hispaniolâ (*Sw., Bertero!*), et Cubâ (*De la Sagr.! in herb. DeC.*).
2. W. angulata (*Jacq. H. Schœnbr. t.* 30.), pedunculis crassioribus, calyce et

corollâ impunctatâ. Culta in Hort. Mauritii et inde Vindobonæ. Ex Indiâ Orient. dicitur, sed verisimilius ex Americâ.

III. WEIGELTIA.

CHAR. *Calyx* et *corolla* 4-partiti. *Stamina* 4, imæ basi corollæ inserta: *filamenta* libera, filiformia, lobis corollæ breviora: *antheræ* ovoideæ, filamentis multo breviores, horizontales, loculis longitudinaliter dehiscentibus. *Stylus* staminibus triplo brevior, acuminatus. *Bacca* .....

W. MYRIANTHOS (Wallenia myrianthos *Reichenb. in Weigelt. Plant. Exs. Surin.*). ♄. Circa Surinam.

Rami lignosi, glabri, cinerascentes. *Folia* obovata, plus minusve acuta, glabra, integra, subtus pallidiora, 3—5 poll. longa, $1\frac{1}{2}$—$2\frac{1}{2}$ poll. lata, subpunctata, punctis pellucidis rubescentibus, oculo armato videndis. *Pedunculi* numerosi, alterni, in axillis foliorum, patentes, 2—4 poll. longi, subvelutini, bracteis alternis oblongis lineam longis, ramulis floriferis alternis. *Pedicelli* lineam longi, secundum pedunculos eorumque ramos alterni. *Lobi calycis* oblongi, obtusi, punctati, glabri, $\frac{1}{2}$ lin. longi. *Lobi corollæ* ovati, obtusi, calyce duplo longiores, glabri, albidi? ex rubro punctati.

Differt à Walleniâ inflorescentiâ; calyce et corollâ profunde divisis, minime tubulosis; filamentis liberis, stylo staminibusque brevioribus. Flos omnino *Emboliæ*, præter numerum quaternarium.

Nuncupavi in honorem botanophili *Weigelt*, qui primus eam plantam legit.

IV. CONOMORPHA.

Walleniæ spec. *Mart. Nov. Gen.* iii. *p.* 89.

Conostylus. *Pohl in litt. ad DeC.*

CHAR. *Calyx* et *corolla* 4-fidi, infundibuliformes. *Stamina* 4, corollâ duplo breviora: *filamenta* ad superiorem partem tubi corollæ inserta, brevissima, libera: *antheræ* erectæ, ovoideo-triangulares, inclusæ, basi affixæ, loculis longitudinaliter dehiscentibus. *Ovarium* conicum (in floribus abortivis?) vel subglobosum (in fertilibus?). *Stylus* brevis. *Stigma* simplex. *Drupa* monosperma.

VEGET. Arbusculæ Americanæ; foliis alternis, integris, multipunctatis, coria-

ceis, magnitudine in eodem ramo variantibus. Racemi axillares, pedicellis alternis brevissimis axillis bracteolarum. Flores verosimiliter polygami ovario non semper accrescente.

Nomen mutavi propter *Conostylis* Br.

Species.

1. C. OBLONGIFOLIA (Conostylus oblongifolius *Pohl! ined.*), foliis oblongis, pedunculis petiolo brevioribus. In Brasiliâ (*Pohl in herb. DeC.!*).

Rami sublignosi, tenues, glabri. *Folia* oblonga vel obovata, 3—4 poll. longa, 12—15 lin. lata, obtusa vel acuta, in petiolos longos pollicares angustata, margine subrevoluta, superne nitida, subtus punctis crebris minimis nigricantibus insignia. *Pedunculi* vix pollicares, multiflori, simplices, vel a basi ramosi, glabri, crassiusculi. *Flores* alterni, subsessiles, 1½ lin. longi. *Bracteæ* ovatæ, obtusæ, caducæ, glabræ, longitudine florum. *Lobi calycis* et *corollæ* ovato-acuti, glabri, subpunctati. *Corolla* calyce infundibuliformis, vix duplo longior, albida. *Filamenta* membranacea, tubo corollæ fere omnino connata, vel si velis ejus apice inserta. *Antheræ* subsessiles, luteæ, lobis corollæ breviores. *Stylus* corollâ dimidio brevior.

2. C. LAXIFLORA, foliis obovatis v. oblongis obtusiusculis versus basin cuneatis, racemis folio longitudine subæqualibus pendulis, bracteis lineari-lanceolatis acuminatis, laciniis calycinis triangularibus subciliatis, corollæ campanulatæ lobis apice reflexis. ♄. Ad flumen Amazonum (*Mart.*). Wallenia laxiflora. *Mart. Nov. Gen.* iii. *p.* 89.

V. CYBIANTHUS.

Cybianthus. *Mart. Nov. Gen.* iii. *p.* 87.

CHAR. *Calyx* profunde 4-fidus. *Corolla* 4-fida, rotata, plana, ambitû fere quadrato, lobis uti calyx punctis atque lineis glandulosis immersis notata. *Stamina* 4: *filamenta* brevissima: *antheræ* subsessiles, oblongæ, erectæ, apice biporosæ. *Ovarium* superum, minutum (abortivum?), depresso-globosum. *Stigma* sessile, subcapitatum. *Ovula* an plura, erecta? *Drupa* monosperma?

VEGET. Arbusculæ Brasilienses, foliis sparsis versus ramorum extremitates

approximatis, petiolatis, glanduloso-tuberculatis; floribus parvis unibracteatis in racemis pendulis vel erectiusculis, axillaribus. Lobi corollæ et præcipue calycis fimbriato-pilosi.

Species.

1. C. PENDULINUS (*Mart. Nov. Gen.* iii. *p.* 87. *tab.* 236.), foliis oblongis utrinque acutis glabris, petiolis basi pilosis, racemis laxis pendulis folio subæqualibus pubescentibus, laciniis calycinis acutis. ♄. In provinciâ Rio Negro Brasiliensium (*Mart.*).
2. C. CUNEIFOLIUS (*Mart. Nov. Gen.* iii. *p.* 88.), foliis late lanceolatis acutis versus basin longe cuneatis glabris, petiolis pilosis, racemis patentibus foliis triplo brevioribus pubescentibus, laciniis calycinis obtusiusculis. ♄. Prope Sebastianopolim Brasiliensium (*Mart.*).
3. C. PRINCIPIS, foliis lanceolatis apice attenuatis et obtusiusculis, paniculis axillaribus et terminalibus folio brevioribus, pedunculis patentibus angulosis, floribus apice subfasciculatis, laciniis corollæ oblongis reflexis. Ad flumen Ilheos Brasiliæ (*Princ. Neuwied.*). Wallenia angustifolia. *Nees et Mart. Beitr. zur Fl. Bras. in Nov. Act. Acad. Nat. Cur.* xi. *p.* 87.
4. C. HUMBOLDTII. Ardisia tetrandra. *Kunth in Humb. et Bonpl. Nov. Gen.* iii. *p.* 243.

VI. MYRSINE.

Sideroxylon, Scleroxylon, Samaræ, Rœmeriæ, Chrysophylli *Auct. species.*
Myrsine. *Linn. Gen. ed.* i. *p.* 54. *Juss. Gen. p.* 152. *Brown Prodr. p.* 533.
Rapanea. *Aubl. Guian.* i. *p.* 121.
Caballeria. *Ruiz et Pav. Prodr. Fl. Peruv. p.* 141.
Manglilla. *Juss. Gen. Pers. Syn.* i. *p.* 237.
Athrurophyllum. *Lour. Fl. Cochinch. p.* 148.

CHAR. *Calyx* et *corolla* 4-5-6-lobi. *Corollæ lobi* æstivatione imbricatâ. *Stamina* libera: *filamenta* brevissima, tubo corollæ inserta: *antheræ* sæpius subsessiles, erectæ, acutæ, loculis longitudinaliter dehiscentibus. *Ovarium* ovulis definitis 4—5 (ex Br.). *Stylus* brevis, post anthesin sæpe caducus. *Stigma* fimbriatum, vel lobatum, vel simplex. *Drupa* vel *bacca* pisiformis, monosperma.

VEGET. Arbores vel suffrutices, foliis alternis. Flores polygami vel hermaphroditi, sessiles vel brevipedicellati, fasciculati, fasciculis axillaribus bracteis imbricatis obtusis persistentibus plus minusve obtectis. Genus polymorphum, inflorescentiâ, melius quam characteribus, distinctum.

Species.

A. Stigma fimbriatum vel lobatum.

1. M. URVILLEI, glabra, foliis ovatis obtusis integris pellucido-punctatis, floribus subsessilibus fasciculatis 5-andris polygamis, lobis calycinis minimis dentiformibus, antheris sessilibus ovoideis. ♄. Circa sinum Tasman, in freto Cook, Novæ Zelandiæ (*D'Urvil. in h. DeC.!*).

Rami lignosi, non crassi, in herbario nigricantes. *Folia* 1—2 poll. longa, 6—12 lin. lata, in petiolos breves angustata, obtusa et subemarginata, membranacea, pellucido-punctata, punctis luteis oculo armato videndis. *Fasciculi* pauciflori, pedicellis brevissimis, bracteis imbricatis minimis rotundatis subciliatis. *Calyx* vix perspicuus. *Corolla* 5-partita, lobis lanceolatis vix lineam longis glabris. *Antheræ* ovoideæ, crassæ, longitudine corollæ. Flores fœminei desunt. *Baccæ* vix lineam longæ, ovoideæ. *Semen* unum. *Albumen* corneum. *Embryo* transversus.

Lecta in navigatione navis *Astrolabe*, præfecto clar. D'Urville.

2. M. AFRICANA. *Ait.* Var. β. M. retusa. *Ait.*
3. M. BIFARIA. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 296., *Catal. n.* 2294. M. Potama. *Don.*
4. M. SUBSPINOSA. *Don.*
5. M. SESSILIS. *Don.*
6. M. SEMISERRATA. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 294., *Tent. Fl. Napal.* i. *p.* 34. *tab.* 24., *Catal. n.* 2295.
7. M. VARIABILIS. *Brown, Prodr. p.* 534. *Sieb.! Plant. Exsicc. Nov. Holl.* 262.
8. M. URCEOLATA. *Brown, ibid.*
9. M. CRASSIFOLIA. *Brown, ibid.*
10. M. EXCELSA. *Don.*
11. M. CAPITELLATA. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 295., *Tent. Fl. Napal. p.* 35. *tab.* 25., *Catal. n.* 2296.

Var. β. parvifolia: foliis minoribus, capitulis paucifloris. M. lanceolata. *Wall.! Catal. n.* 2297.—*Hab.* in Sillet. Folia 2—3 poll. longa. Flores subsparsi.

12. M. lucida (*Wall.! Catal. n.* 2298.), foliis lanceolatis integerrimis margine punctatis glabris, floribus lateralibus fasciculatis, lobis calycinis 5 subciliatis ovato-acutis. ♄. In montibus Toongdong regni Burmanici (*Wall.!*).

Arbor parva (ex *Wall.*), ramis crassiusculis, irregulariter bullatis, uniformiter brunneis. *Folia* 4—5 poll. longa, 12—18 lin. lata, acuminata vel obtusiuscula, coriacea, superne glabra et nitida, margine revoluta et ibi subtus punctata, alibi punctis minimis quasi perforatis sub lente videndis tecta, nervo centrali distincto. *Flores* fasciculati, sessiles, inter bracteas ovatas obtusas ciliatas quorum vestigia solum vidi inserti. *Bacca* globosa, intense purpurea (ex *Wall.*). V. sicc.

Ex specimine nostro nimis truncato, differentiam nullam a *M. capitellatâ* perspicere valui; sed clar. Wallich in MSS. diversas esse affirmat.

13. M. Porteriana (*Wall.! Catal. n.* 6525.), glabra, foliis lanceolatis utrinque acutis integris, floribus sessilibus glomerulatis paucis, lobis calycinis 5 ovato-acutis ciliatis. ♄. In Penang (*Porter!*).

Rami non crassi, ex albo maculati, extremitate foliosi. *Folia* 1½—2 poll. longa, 8—10 lin. lata, petiolis 3 lin. longis, glaberrima, subtus pallidiora et oculo armato depresso-punctata. *Flores* nondum aperti in specimine, 2—3 simul fasciculati, parvi. V. sicc.

14. M. Wightiana (*Wall.! Catal. n.* 2300.), glabra, foliis oblongo-lanceolatis acutis integris punctato-scabris, floribus paucis sessilibus, calyce 5-fido, lobis ovato-acutis subciliatis. ♄. In Indiâ Orientali (*Wall.!* ex *Wight.*).

Fragmenta solum vidi. *Rami* lignosi, duri, ad originem foliorum florumque inflati et cicatrisati. *Folia* extremitate ramorum approximata, 2—3 poll. longa, 6—12 lin. lata, obtusa vel sæpius acuta, petiolis 5 lin. longis, coriacea, punctis eminentibus crebris rotundis ubique sparsis. *Flores* fasciculati, sessiles, fasciculis paucifloris axillaribus, quorum vestigia solum vidi. *Bacca* . . . . .

15. M. LINEARIS. *Poir. Dict. Suppl.* iii. *p.* 709. Athrurophyllum lineare. *Lour. Fl. Coch.* i. *p.* 148.

16. M. MITIS. *Spreng. Syst.* i. *p.* 663. Sideroxylon mas inerme. *Mill. Ic. tab.* 299.? Sideroxylon mite. *Linn. Syst. p.* 232. *Jacq. Coll.* ii. *p.* 249. Scleroxylon mite. *Willd.* An a sequente satis distincta?

17. M. MELANOPHLEOS. *Brown Prodr. p.* 533. Sideroxylon melanophleum. *Linn. Mant. p.* 48. *Jacq.! Hort. Vind.* i. *tab.* 71.

18. M. SAMARA. *Rœm. et Sch. Syst.* iv. *p.* 511. ex *Brown Prodr. p.* 533. Samara pentandra. *Ait.* An a *M. miti* diversa?

19. M. AVENIS (Ardisia avenis *Blum.*).

20. M. MADAGASCARIENSIS, foliis oblongis obtusis integris glabris coriaceis crassis subtus ex nigro punctatis, floribus fasciculatis, lobis calycinis 5 ovatis subciliatis, baccâ globosâ pedicellatâ. ♄. In Madagascar (*Goudot in h. DeC.!*).

Rami lignosi, crassi, glabri, cicatrisati. *Folia* 2—4 poll. longa, 1—2 lata, obtusa vel emarginata, in petiolos angustata et cuneata, punctis minimis medio sub lente quasi depressis ubique adspersa. *Bracteæ* arctè imbricatæ, parvæ, rotundatæ, glabræ. *Pedicelli* (post anthesin) 3 lin. longi. *Baccæ* 2 lin. longæ, stylo delapso.

21. M. RAPANEA. *Rœm. et Sch. Syst.* iv. *p.* 509. ex *Brown Prodr. p.* 533. Rapanea guianensis. *Aubl. Guian. tab.* 46. Samara pentandra. *Sw.* (non *Ait.*). Caballeria coriacea. *Meyer, Prim. Essequeb. p.* 118. In Guianâ Gallicâ (*Aubl.*), insulâ Trinitatis (*Sieb.!*), et circa Bahiam (*Lhotsky! in h. DeC.*).

22. M. CORIACEA. *Rœm. et Sch.* ex *Brown Prodr. p.* 533. Samara coriacea. *Sw.!* In Jamaicâ (*Sw.*), Porto-Ricco (*Le Dru! in h. DeC.*), et Cubâ (*Sagra! in h. DeC.*).

23. M. FLORIDANA, glabra, foliis ovali-oblongis integris coriaceis subtus punctatis, fasciculis paucifloris, calyce 5-partito. ♄. In Floridâ (*Mich.! in h. DeC.*).

Sideroxylon punctatum. *Lam. Ill. n.* 2460.? Bumelia? punctata. *Rœm. et Sch. Syst.* iv. *p.* 498?

Rami lignosi, non crassi, lenticellis ovatis albidis. *Folia* 2—3 poll. longa,

1—1½ poll. lata, obtusa vel subacuta, in petiolos 3 lin. longos angustata, superne nitida, subtus pallidiora et ubique punctulata. *Fasciculi* pauciflori sed numerosi. *Bracteæ* ovatæ, imbricatæ, parvæ, persistentes. *Baccæ* globosæ, lineam longæ, maculatæ, pedicello vix lineam longo, lobis calycinis 5 dentiformibus glabris ½ lin. longis, stylo truncato crassiusculo.

Affinis *M. Manglillæ*, sed foliis potius oblongis brevius petiolatis, et *M. coriaceæ*, a quâ differt foliis majoribus, nunquam emarginatis, ovali-oblongis nec cuneato-oblongis, fructû valde maculato.

24. M. MANGLILLA. *Ræm. et Sch.* ex *Brown Prodr. p.* 533. Sideroxylon Manglillo. *Lam. Dict.* i. *p.* 245. Manglilla. *Juss. Gen. p.* 151. Caballeria oblonga. *Ruiz et Pav. Syst.* i. *p.* 280. Circa Limam (*Nees! in h. DeC.*).

25. M. TRINITATIS, foliis ellipticis utrinque acutis glabris integris subtus punctatis, fasciculis paucifloris, floribus pedicellatis minimis. M. coriacea. *Sieb.! Pl. Exsicc. Trinit. n.* 50 *et* 302. ♄. In insulâ Trinitatis (*Sieb.! in h. DeC.*).

Rami lignosi, non crassi, glabri, extremitate ferruginei et subvelutini. *Folia* parva, 1—2 poll. longa, 6—10 lin. lata, in petiolos 4 lin. longos angustata, firma, subtus pallidiora et punctata, interdum lineis nigris maculata. *Pedicelli* lineam longi, glabri. *Calyx* 5-fidus, lobis minimis lanceolatis. *Lobi corollæ* ½ lin. longi, lanceolati. An flores in specimine nostro abortivi? V. sicc.

A *M. coriaceâ* differt foliis acutis, floribus minoribus glabris.

26. M. SALICIFOLIA, foliis ellipticis utrinque acutis integris, petiolis pilosis, fasciculis multifloris, lobis 5 calycis ciliatis, baccæ globosæ maculis oblongis. Bumelia salicifolia. *Bert. ined. in h. Balbis!* ♄. In Guadaluppâ (*Bert.! in h. DeC.*).

Rami lignosi, non crassi, lenticellis minimis punctiformibus, apice subvelutini. *Folia* 1½—2 poll. longa, 6—10 lin. lata, in petiolum 4 lin. angustata, firma, subtus pallidiora et punctulata, petiolis et basibus nervorum centralium pilosiusculis. *Baccæ* fasciculatæ, lineam longæ, pedicellis glabris 1½ lin. longis, lobis calycinis ovato-acutis, maculis luteis oblongis, stylo brevi persistente obtuso. V. sicc.

M. Trinitatis valde affinis; diversa tamen videtur foliis magis acutis paulo angustioribus, punctis minus eminentibus, petiolis sublongioribus et pilosis, calyce majore, aliisque forsan characteribus in flore adhuc ignoto.

27. M. Berterii, ramis puberulis, foliis oblongo-lanceolatis subacutis integris superne glabris subtus et petiolo puberulis, floribus subsessilibus subvelutinis, lobis 5 corollæ et calycis obtusis. Sideroxylon mastichodendron. *Balb.! in h. DeC.* ♄. In Hispaniolâ (*Bert.! in h. Balb. et DeC.*).

*Rami petioli*que quasi pulvere tecti. *Folia* 2 poll. longa, 6—8 lin. lata, in petiolum 3—4 lin. longum angustata, superne nitida, subtus oculo armato puberula et punctata. *Flores* 4—5 simul glomerati, bracteis et calycibus puberulis, obtusis, minimis. *Corollæ 5-partitæ lobis* margine cinerascentibus. *Baccæ* globosæ, sessiles, lineam latæ, glabræ, maculis oblongis, stylo truncato terminatæ. V. sicc.

Species a præclaro et nimis infortunato Bertero detecta. *M. salicifoliæ* proxima, sed foliis paulo minoribus, minus acutis, subtus ut cum ramis petiolis floribusque puberulis.

28. M. ferruginea (*Spreng. Syst.* i. *p.* 664.), foliis lanceolatis acutis integerrimis coriaceis pilosiusculis, floribus fasciculatis brevipedicellatis hermaphroditis 5-andris, lobis calycis corollæque acutis, stigmate bilobo. Caballeria ferruginea *Ruiz et Pav. Syst.* i. *p.* 280. ♄. In montibus nemorosis Peruviæ (*Ruiz et Pav.*).

Rami pilosiusculi. *Folia* utrinque acuta, 2½ poll. longa, 1 poll. lata, petiolata, pilosiuscula, petiolo et nervo centrali rufo-velutinis, subtus ferruginea et punctata. *Flores* (an semper?) hermaphroditi. *Pedicelli* crassiusculi, lineam longi, bracteolis minimis basi circumdati! *Calyx* 5-fidus, glabriusculus. *Stylus* vix lineam longus, apice obscure bilobus. *Baccæ* valde maculatæ. V. sicc.

29. M. rufescens, ramis et nervis foliorum velutinis rufescentibus, foliis oblongo-lanceolatis acutis integris longè petiolatis, floribus 4-andris, stigmate bilobo crassiusculo. ♄. In sylvaticis et fruticetis Corcovado, prope Rio Janeiro (*Lhotsky! in h. DeC.*).

Arbor 8—10-pedalis, ramis virgatis velutinis rubiginosis. *Folia* 2—3 poll. longa, 1—1½ lata, in petiolum 4 lin. long. attenuata, puberula, subtus pallidiora et punctulata. *Flores* sessiles, axillares, ad ramorum basin, fasciculati. *Calyx* 4-fidus, lobis minimis ovatis puberulis. *Corolla* ignota. *Baccæ* globosæ, vix lineam latæ, 1-spermæ, maculis elongatis crebris notatæ, glabræ, stylo caduco, ½ lin. longo. V. sicc.

30. M. latifolia. *Spreng.* Caballeria latifolia. *Ruiz et Pav. Syst.* i. *p.* 279.
31. M. pellucida. *Spreng.* Caballeria pellucida. *Ruiz et Pav., ibid.*
32. M. dentata. *Spreng.* Caballeria dentata. *Ruiz et Pav., ibid. p.* 281.
33. M. venosissima. *Spreng.* Caballeria venosissima. *Ruiz et Pav., ibid. p.* 282.
34. M. dependens (*Spreng. Syst.* i. *p.* 664.), ramis dependentibus velutinis, foliis confertis late ellipticis retusis vel mucronulatis integris ciliatis superne nitidis subtus valde punctatis, floribus axillaribus solitariis vel geminis brevipedicellatis 4-andris, laciniis calycinis ovato-acutis, lobis corollæ oblongis calyce duplo longioribus. ♄. In Peruviæ montibus editioribus (*Ruiz et Pav.*) et Silla de Caracas (*Humb. et Bonpl.*). Caballeria dependens. *Ruiz et Pav. Syst.* i. *p.* 281. Caballeria myrtifolia *h. Deless.!* ex *Ruiz et Pav.* Myrsine ciliata. *Kunth in Humb. et Bonpl. Nov. Gen.* iii. *p.* 248. *tab.* 245.

Folia 4—6 lin. longa, 3 lin. lata, approximata, brevipetiolata, coriacea, subtus pallidiora. *Calyx* 4-fidus, glabriusculus. *Corolla* 4-partita, lobis externe puberulis. *Stamina* lobis corollæ breviora, subsessilia (in specim. fors fœmineo). *Stylus* brevissimus. *Stigma* capitatum, inclusum. *Bacca* ovoideo-globosa, 2 lin. longa, ex nigro maculata. V. sicc.

35. M. popayanensis. *Kunth in Humb. et Bonpl. Nov. Gen.* iii. *p.* 249. Samara myricoides. *Rœm. et Sch. Mant.* iii. *p.* 294. (ex *Kunth in Linnæâ,* 1830. *p.* 367.)

B. Stigma simplex.

36. M. Ardisioides. *Kunth in Humb. et Bonpl. Nov. Gen.* iii. *p.* 249.
37. M. penduliflora (*Icon. Mexic. ined.*), glabra, foliis ovatis obtusiusculis in petiolum angustatis integris, umbellis axillaribus pendulis petiolis dimidio

brevioribus, dentibus 5 calycis ovato-acutis minimis, corollæ 5-partitæ lobis calyce triplo majoribus ovato-acutis, antheris lanceolatis sessilibus medio loborum corollæ insertis iisque brevioribus, stylo acuto? incluso, baccâ globosâ. ♄. In Mexico.

Folia pollicem longa, 5—6 lin. lata, petiolis 4 lin. longis. *Flores* nunc solitarii, nunc 2—5 simul congesti et umbellati. *Corolla* albo-rosea. *Stylus* in figurâ floris quasi truncatus obtusiusculus, in figura baccæ subulatus.

38. M. CANARIENSIS (*Spreng. Syst.* i. *p.* 663.), foliis ovali-oblongis obtusiusculis subsessilibus amplis glabris coriaceis integris, floribus axillaribus fasciculatis sessilibus, calyce 5—6-dentato, corollæ 5—6-fidæ lobis lineari-lanceolatis, staminibus inclusis medio corollæ insertis, antheris acutis, stylo incluso acuminato. ♄. In Teneriffâ (*Willd. Chr. Smith!*) Scleroxylon canariense. *Willd. Mag. Berl. Naturf. Freund.* iii. *p.* 59. Manglilla canariensis. *Rœm. et Sch. Syst.* iv. *p.* 505.

Rami crassi, glabri, albo maculati. *Folia* 4—6 poll. longa, 2—4 poll. lata. *Inflorescentia* generis, glomerulis 3—8-floris, bracteis imbricatis glabris rotundatis. *Lobi calycis* ovati, obtusi, subciliati. *Corolla* calyce quadruplo longior. *Stigma* in alabastro acuminatum. *Bacca* globosa.—Variat foliis plus minusve pellucido-punctatis, punctis rotundis seu oblongis. V. sicc.

39. M. PACHYSANDRA (*Wall.! in Roxb. Fl. Ind.* ii. *p.* 297., *Catal. n.* 2284.), ramis velutinis, foliis lanceolatis acuminatis integris punctatis superne glabris subtus pilosiusculis nervis lateralibus arcuatis, floribus fasciculatis pedicellatis hermaphroditis, lobis 5 calycis ovatis ciliatis, corollæ 5-partitæ lobis reflexis, antheris magnis triangularibus in præfloratione connatis, stylo acuminato. ♄. In insulâ Penang (*Porter*), et Singapore (*Wall.!*).

Species anomala, punctis foliorum et flore Ardisia potius quam Myrsine, sed inflorescentiâ ultimi generis. Alabastrum spiraliter contortum, æstivatione imbricatâ. Fors genus novum?

Species ignotæ et dubiæ.

40. M. SCABRA. *Gærtn. Fruct.* i. *p.* 282.

41. M. læta. Samara læta. *Sw. Prodr. p.* 151. (non *Linn.*).

42. M. myrtifolia. Samara myrtifolia. *Willd. MSS. in Rœm. et Sch. Mant.* iii. *p.* 220. Clar. Kunth ignota (*Linnæa,* 1830. *p.* 367.) quamvis ex itinere Humboldtiano. An Caballeria dependens *Ruiz et Pav.* (Myrsine dependens *Spreng.*) quæ in h. Deless. sub nomine *Caball. myrtifoliæ* adest ?

43. M. saligna. Samara saligna. *Willd. MSS. in Rœm. et Sch. Mant.* iii. *p.* 220. Clar. Kunth ignota. Vid. *Linnæa,* 1830. *p.* 367.

VII. Badula.

Barthesia. *Commers. in h. Mus. Par.*

Badula. *Juss. Gen. p.* 420. (excl. syn. Burm. Zeylan.).

Anguillariæ spec. *Lam. Ill.*

Myrsine spec. *Rœm. et Sch.*

Char. *Calyx* 5-lobus. *Corolla* 5-fida. *Stamina* 5, corollâ breviora: *antheræ* subsessiles acutæ, liberæ, biloculares, loculis rimâ longitudinali dehiscentibus. *Stylus* staminibus brevior. *Stigma* crassum capitatum vel obscure lobatum. *Bacca* globosa.

Veget. Arbores vel frutices, foliis alternis integris punctatis, inflorescentiâ Ardisiarum, nempe pedicellis extremitate pedunculorum approximatis vel umbellulatis.

Patria. Insulæ Mauritii et Borboniæ.

Species.

1. B. micrantha, pedunculis velutinis, foliis late oblongis obtusis glabris paniculis terminalibus pyramidatis foliis longioribus multifloris floribus velutinis minimis, alabastris globosis. ♄. In Borboniâ vel Mauritio (*h. DeC.!* ex *h. Mus. Par.*).

Rami cortice rugoso, lenticellis oblongis crassis, junioribus pedunculis et pedicellis subvelutinis. *Folia* 1½—2 poll. longa, 10—15 lin. lata, in petiolos 4 lin. longos marginatos sæpe denticulatos angustata, ubique punctata, punctis pellucidis rubescentibus. *Panicula* plus minusve elongata, pedunculis et pedicellis alternis, bracteis subulatis pedicellis lineam longis vix longioribus caducis. *Lobi calycis* acuti, minimi. *Alabastra* velutina,

½ lin. lata. *Lobi corollæ* ovati, obtusi, æstivatione subimbricatâ. *Antheræ* subsessiles, acutiusculæ, lobis corollæ breviores, erectæ. *Ovarium* ovoideum. *Stylus* brevissimus. *Stigma* obtusum. *Pistillum* totum corollâ duplo triplove brevius. V. sicc.

2. B. Barthesia, foliis lanceolatis subacutis basi longe angustatis glabris tenuibus punctulatis, pedunculis racemosis multifloris folio subbrevioribus, lobis calycinis obtusis ciliatis, antheris acutis, stigmate capitato obscure lobato. ♄. In Mauritio (*h. DeC.! ex h. Mus. Par.*). Barthesia. *Commers.! in h. Mus. Par.* Badula. *Juss. Gen. p.* 240. Anguillaria Barthesia. *Lam. Ill. n.* 2742. Myrsine Barthesia. *Rœm. et Sch. Syst.* iv. *p.* 507.

Rami cortice flavido. *Folia* semipedalia, 2—2½ poll. lata, punctis parvis sparsis rubescentibus. *Pedunculi* numerosi, axillares, paniculam semipedalem præbentes, glabriusculi, rigidi; pedicellis alternis 3 lin. longis. *Calyx* vix lineam longus. *Corolla* 5-fida, alba (ex *Poir.*), lobis obtusis calyce duplo longioribus. *Antheræ* subsessiles. *Ovarium* globosum. *Stylus* staminibus brevior. *Stigma* subtrilobum. Vulgo *Bois de Pintade.* V. sicc.

3. B. insularis, glabra, foliis ovatis obtusis coriaceis, pedunculis folio brevioribus, pedicellis alternis, calyce 5-partito, alabastris ovoideis, stigmate obtuso. ♄. In Borboniâ aut Mauritio (*h. DeC.! ex h. Mus. Par.*).

Rami non crassi, ferruginei. *Folia* 1—3 poll. longa, 6—15 lin. lata, in petiolos 3 lin. longos crassos angustata, nervis in herbario pulchre reticulatis. *Pedunculi* prope extremitatem ramorum axillares, foliis fere dimidio breviores, crassiusculi, velutini, ramulis eorum alternis brevibus, pedicellis lineam longis basi articulatis, bracteis minimis caducis. *Lobi calycis* patentes, acuti, subciliati, vix lineam longi. *Alabastrum* glabrum, lineam longum, obtusiusculum. *Antheræ* filamentis longiores. *Ovarium* ovoideum. *Stylus* brevissimus, obtusus, antheris in alabastro brevior. V. sicc.

4. B. Sieberi (tab. 5.), foliis obovatis obtusis petiolatis pellucido-punctatis glabris, pedunculis axillaribus foliis quadruplo brevioribus 4—8-floris, alabastris obtusis, lobis calycinis ovato-acutis subciliatis, antheris cuspidatis. ♄. In Mauritio. Ardisia latifolia. *Sieb.! Fl. Maurit.* xi. *p.* 53. (non *Rœm. et Sch.*).

Rami crassi. *Folia* 3—4 poll. longa, 1—1½ poll. lata, petiolis 3—5 lin. longis, oculo armato punctis adspersa crebris sæpius pellucidis nonnunquam rubris, extremitate ramorum approximata. *Pedunculi* axillares, versus apicem ramorum, 1—2 poll. longi, velutini; pedicelli alterni et subumbellati, 2—3 lin. longi. *Bracteæ* ovato-acutæ, semilineares, caducæ. *Corolla* 5-fida, calyce duplo longior, punctata, patens, lobis obtusis, lineam longis. *Stamina* corollâ duplo breviora, hastata; antheris filamento duplo longioribus. *Ovarium* superum, ovoideum. *Stylus* staminibus duplo triplove brevior. *Stigma* peltatum aut subbilobum.—Specimen delineatum in herb. Mus. Paris. erat, sub nomine *Celastri*. *Pedunculi* crebriores quam in aliis paniculam quamdam inter folia præbent.

5. B. OVALIFOLIA, glabra, foliis ovalibus utrinque acutis membranaceis ex nigro punctatis, pedunculis foliis triplo brevioribus, alabastris ovoideis valde punctatis, antheris subsessilibus, stylo brevi obtuso. ♄. In Borboniâ vel Mauritio (*h. DeC.! ex h. Mus. Par.*).

Rami crassi. *Folia* 3—6 poll. longa, 2—3 lata, regulariter ovalia, utrinque angustata, tenuia, in herbario viridia, punctis oculo nudo perspicuis margine crebrioribus. *Pedunculi* ut flores punctati et maculati, 2—3 poll. longi, racemosi. *Flores* non parvi, laciniis calycinis minimis acutis; lobis corollæ ovato-acutis. *Antheræ* acutiusculæ. *Ovarium* ovoideum. *Stylus* staminibus brevior, obtusissimus, an demum lobatus? V. sicc.

6. B. CRASSA, glabra, ramis crassis, foliis ellipticis vel oblongis obtusis coriaceis, pedunculis folio brevioribus, pedicellis alternis brevibus. ♄. In Borboniâ aut Mauritio (*h. DeC. ex h. Mus. Par.*).

Rami lignosi, cicatricibus latis. *Folia* 3—5 poll. longa, 1½—2 poll. lata, plus minusve obtusa, in petiolos 3—4 lin. angustata, oblonga vel elliptica, sub lente punctulata, punctis quasi medio perforatis ut in *Myrsinibus*. *Pedunculi* crassi, patentes, axillares, extremitate rami approximati. *Pedicelli* 1½ lin. longi, crassi, basi articulati, bracteis caducis. *Calyx* (in baccâ) obscure lobatus, lobis ½ lin. longis obtusis? *Bacca* globosa, 2 lin. longa, substriata, stylo truncato brevi terminata. V. sicc.

7. B. ANGUSTIFOLIA, foliis lanceolatis utrinque acutis subintegris punctatis gla-

berrimis, pedunculis velutinis rigidis axillaribus foliis sublongioribus. ♄. In excelsioribus Borboniæ (*Bory! in h. DeC.*).

Rami rigidi, tenues, ferruginei, glabri. *Folia* 12—15 lin. longa, 4—6 lin. lata, firma, superne nitida, integra vel uno latere versus extremitatem irregulariter dentata, petiolis 2—3 lin. longis tenuibus, punctis nigricantibus crebris ubique sparsis. *Pedicelli* alterni, lineam longi, ut pedunculi velutini, angulo recto divergentes, supra originem post anthesin rupti, ita ut pedunculi angulosi vel quasi nodosi demum sint. *Calycis 5-fidi lobi* pilosiusculi, acuti. *Baccæ* gobosæ, lineam latæ, ex nigro maculatæ, stylo persistente obtuso terminatæ.—Species habitû a præcedentibus diversa, ad *Ardisias americanas* potius accedens.

VIII. Oncostemum.

Oncostemum. *Adr. Juss. Nouv. Ann. du Mus.* i. *p.* 133. *tab.* 11. *Calyx* et *corolla* 5-fidi. *Stamina* connata in massam ovoideam cylindricamve, basi cum tubo corollæ coalitam, apice 5-dentatam. *Ovarium* superum. *Stylus* simplex. *Stigma* subinfundibuliforme, subintegrum, denticulatumve, etc.

Frutices Madagascarienses, habitû *Ardisiarum* et *Badularum*. Species 2.

IX. Ardisia.

Ardisia. *Sw. Prodr. p.* 48. *Brown, Prodr. p.* 533. *Roxb. Fl. Ind.* ii. *p.* 268.
Anguillaria. *Gærtn.* i. *p.* 372.
Bladhia. *Thunb. Fl. Jap. p.* 7.
Pyrgus. *Lour. Fl. Coch. p.* 149.

Char. *Calyx* 5-fidus. *Corolla* 5-fida, lobis æstivatione imbricatâ. *Stamina* 5: *filamenta* libera: *antheræ* liberæ vel (rarius) connatæ, longitudine filamentis æquales vel majores, erectæ, triangulares, acutæ vel acuminatæ, loculis rimâ longitudinali dehiscentes. *Ovarium* subglobosum. *Stylus* filiformis, staminibus longior, persistens. *Stigma* simplex, subulatum vel punctiforme. *Ovula* (ex Brown) 5, vel magis. *Bacca* globosa.

Veget. Arbores, frutices, vel suffrutices vix lignosi; foliis alternis, rarius suboppositis subternisve, punctatis; floribus plus minusve paniculatis, pani-

culis nunc multifloris extremitate ramorum foliis longioribus, nunc paucifloris axillis foliorum, pedicellis apice pedunculorum subumbellatis. Flores majores quam in Myrsinibus, semper hermaphroditi, albi vel rosei, sæpe punctati.

Sectio 1. *Ardisiæ veræ.*

Antheræ liberæ, filamentis longiores. *Stylus* subulatus staminibus longior. *Bracteæ* pedicellis multo breviores.

§ 1. Folia integra.

* Folia glabra.

1. A. ACUMINATA. *Willd.* Icacorea guianensis. *Aubl. tab.* 368.
2. A. TINIFOLIA. *Sw.*
3. A. LAURIFOLIA. *Lam.* A. latifolia (errore typogr.). *Rœm. et Sch.*
4. A. MACULATA (*Poiteau! in h. DeC.*), foliis oblongis obtusis coriaceis, paniculâ terminali ramosâ multiflorâ pyramidali, lobis calycinis ovalibus obtusis amplis, baccâ maculatâ. ♄. In Hispaniolâ (*Poiteau*). A. domingensis *h. Willd.? Rœm. et Sch. Syst.* iv. *p.* 803?

Rami lignosi, crassi. *Folia* 2—2½ poll. longa, 12—15 lin. lata, valde coriacea, glaberrima, non proprie punctata sed subtus quodammodo bullata seu aspera. *Pedunculi* et *pedicelli* glabri, articulati, crassi. *Lobi calycis* 2 lin. longi, glabri, imbricati. *Bacca* 2 lin. lata. V. sicc.

5. A. CAPOLLINA (*Icon. Mexic. ined.*), foliis lanceolatis utrinque acutis nitidis, paniculâ terminali foliis longiore compositâ, pedunculis alternis, pedicellis umbellatis, lobis corollæ ovatis acutis reflexis calyce quadruplo longioribus. ♄. In Mexico.

Bracteæ caducæ, pedicellis multo breviores. *Alabastra* ovoidea, acuta. *Calyx* et *corolla* 5-fidi. *Antheræ* erectæ, acuminatæ. *Stylus* exsertus, subulatus. *Baccæ* globosæ, colore vinoso. *Flores* albo-rosei. Vulgò *Capollin.*

6. A. REVOLUTA. *Kunth, in Humb. et Bonpl. Nov. Gen. Schlecht. et Cham. in Linnæâ,* 1830. *p.* 125.
7. A. COMPRESSA. *Kunth, in Humb. et Bonpl. Nov. Gen.* iii.
8. A. MICRANTHA. *Kunth, ibid.*

9. A. ORINOCENSIS. *Kunth, ibid.*
10. A. FERRUGINEA. *Kunth, ibid.*
11. A. THYRSIFLORA. *Don, Prodr.*
12. A. PURPUREA. *Blume, Bijtr. tot Fl. Nederl. Ind. p.* 684.
13. A. MUCRONATA. *Blume, ibid.*
14. A. SANGUINOLENTA. *Blume, ibid.* non *Wall.*
15. A. ROTHII. A. pyramidalis. *Roth, Nov. Pl. Sp. p.* 123. (*excl. syn. Cavan.*). Ab A. pyramidali *Cavan.* differt foliis integerrimis.—*Hab.* in Indiâ Orient. (*Roth ex h. Heyn.*). Forsan una ex Ardisiis clar. Wallich.
16. A. PYRGUS. *Rœm. et Sch. ex auctor. Brown.* Pyrgus racemosa. *Lour.*
17. A. LANCEOLATA. *Roxb. Fl. Ind.* ii. *p.* 270. *Wall.! Catal. n.* 2292.
18. A. PANICULATA. *Roxb. Fl. Ind.* ii. *p.* 270. *Wall.! ibid. et Catal. n.* 2268. *Bot. Reg. tab.* 638. A. Doca. *Herb. Hamilt.!*—In Bengaliâ Septentr. ad Orient., circa Sillet (*Wall.*), et Rangamati (*Hamilt.*).
19. A. ANCEPS. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 280., *Catal. n.* 2261.
20. A. COMPLANATA. *Wall. ibid., Catal. n.* 2277. A. polycarpa. *Wall.! Catal. n.* 2285. ♄. In ins. Penang (*Wall.! ex Porter*), et circa Chappedong, orâ Tennasserim (*Wall.!*). Flores minores quam in præcedente, rami minus compressi, folia breviora minus angustata, pedunculi tandem minus divaricati.
21. A. FLORIBUNDA. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 272. *Catal. n.* 2263.
22. A. BLUMII. A. anceps. *Blume, Bijtr. tot Fl. Nederl. Ind. p.* 685. non *Wall.*
23. A. SCANDENS. *Blume, ibid. p.* 686.
24. A. MISSIONIS (*Wall.! Catal. n.* 6524. *ex h. Madras.*), glabra, foliis oblongo-lanceolatis, paniculâ terminali laxâ longitudine foliorum, lobis calycinis ovato-acutis. ♄. In Indiâ Orientali.

Folia extremitate ramorum approximata, 4—5 poll. longa, 1½ lata, basi longe angustata, punctis ubique sparsis sed lente solum perspicuis et paginâ inferiori quasi medio perforatis. *Pedunculi* axillares, remotiusculi, bracteis caducis nudi, 3—6-flori, subpaniculati. *Pedicelli* 3—6 lin. longi. *Lobi calycis* subulati. *Corollæ profunde 5-fidæ lobi* lanceolati acuminati. *Antheræ* subsessiles, longitudine corollæ, acuminatæ. *Stylus* subulatus, staminibus sublongior. V. sicc.

25. A. humilis. *Vahl, Symb. p.* 40. *Blume, Bijtr. p.* 687. *Wall.! Catal. n.* 2283, F. *et* M. A. solanacea. *Roxb.! Plant. Corom.* i. *p.* 27. *tab.* 27. *Sims in Bot. Mag. tab.* 1677. *Wall.! Catal. n.* 2283. A. littoralis. *Andr. Bot. Rep.* 630. A. Doma. *Wall. Catal. n.* 2283, B. *ex h. Hamilt.!* A. oleracea. *Ibid.* G. A. umbellata. *Roxb. Fl. Ind.* ii. *p.* 273. *Lodd. Bot. Cab. tab.* 531. *Wall.! Catal.*, 2283, H. *ex h. Hamilt.!* A. nana. *Ibid.*, L.

Var. β.: foliis magis acutis membranaceis, nervis prominulis, pedunculis et pedicellis elongatis paucifloris. A. solanacea. *Wall.! Catal.* 2283, A. *et* K.

Var. γ.: floribus maximis, bracteis amplioribus. A. grandiflora. *Wall.! Catal. n.* 2372.

Var. δ.: foliis majoribus utrinque nitidis. A. Wightiana. *Wall.! Catal. n.* 2330.

♄. In Zeylonâ (*Burm.*), Coromandeliâ (*Roxb.*), Nepaliâ (*Wall.*), Bengaliâ (*Roxb.!*), insulâ Penang (*Wall. in Roxb. Fl. Ind.*), Martabaniâ (*Wall.!*), insulâ Haynan (*Dahl ex Vahl*), Sumatrâ (*Roxb.*), Javâ (*Blume*).—β. in montibus Sillet; γ. in mont. dictis Nilghiry.

26. A. lurida. *Blume, Bijtr. p.* 688. An a præcedente diversa?

27. A. pedunculosa. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 270. *Catal.* 2271.

28. A. neriifolia (*Wall.! Catal. n.* 2278.), foliis oblongis acuminatis longe petiolatis nervis parum distinctis, paniculis laxis terminalibus lateralibusque folio brevioribus, pedunculis et pedicellis subvelutinis, laciniis calycinis minimis acutis ciliatis, lobis corollæ ovato-acuminatis, stylo exserto, antheris cuspidatis subsessilibus. Tab. 8. ♄. In Sillet (*Wall.!*).

Var. β. *montana*, foliis oblongo-lanceolatis longe acuminatis, pedicellis brevioribus, laciniis calycinis latioribus, alabastris minus acuminatis. A. neriifolia? β. *Wall.! Catal. n.* 2278. In montibus Sillet (*De Silva!*).

In var. α. pedunculi nonnunquam elongati et cirrhosi.

29. A. divergens. *Roxb.! Fl. Ind.* ii. *p.* 275. *Wall.! ibid. Catal. n.* 2269. A. punctata. *Jack ined. ex Wall.* ♄. In Moluccis (*Roxb.*), et ins. Penang (*Wall.!*).

30. A. polycephala (*Wall.! Catal. n.* 2293.), glabra, foliis oblongis acutis amplis margine inæqualiter subtus revolutis, pedunculis ad apicem ramorum numerosis multifloris foliis duplo brevioribus compressis, floribus

dense racemosis, lobis calycinis obtusis, alabastris acutis, stylo incluso. ♄. Ad ripas fluminis Atran (*Wall.!*).

Folia 5—7 poll. longa, 1½—2½ poll. lata, coriacea, petiolis 4—5 lin. longis. *Pedunculi* axillares versus apicem ramorum; *pedicelli* semipollicares incurvati extremitate pedunculorum approximati. *Flores* 3 lin. longi. *Lobi calycis* obtusiusculi, corollæ acuminati. *Antheræ* subsessiles, acutæ. *Baccæ* globosæ, 2 lin. latæ, in herbario nigræ, striatæ. V. sicc.

31. A. TUBERCULATA (*Wall.! Catal. n.* 2274.), foliis ovato-acuminatis coriaceis ubique punctatis, racemis axillaribus et terminalibus multifloris folio brevioribus, pedunculis subcompressis glabris, laciniis calycinis ovato-acutis subciliatis. ♄. In Singapore (*Wall.!*).

Rami superne angulato-compressi. *Folia* 2—4 poll. longa, 8—12 lin. lata, in petiolos 3—4 lin. longos basi angustata, acuminata, nervo centrali distincto, lateralibus vix perspicuis, utrinque et ubique (ut pedunculi) resinoso-punctata. *Pedunculi* valde divergentes; *pedicelli* basi articulati umbellulati. *Flores* parvi. *Calycis lobi* acuti, ⅓ lin. longi. *Alabastra* acuta, lobis calycinis duplo longiora. V. sicc.

32. A. ATTENUATA (*Wall.! Catal. n.* 2286, partim), foliis oblongo-lanceolatis utrinque acuminatis margine magis punctatis, pedunculis axillaribus elongatis, floribus racemosis, pedicellis pedunculisque glabris, lobis calycinis ovato-acutis subciliatis. ♄. Circa Tavoy, olim Burmanorum (*Wall.! ex Gomez*).

Ut monet cl. Wallich duæ latent species sub numero 2286, una *A. oblonga* (*n.* 45.), altera hîc descripta, cujus folia majora, 5—8 poll. longa, 15—20 lin. lata, glaberrima, nervis subtus eminentibus, basi in petiolum semipollicarem angustata. *Pedunculi* fructiferi 3—4 poll. longi, nudi; *pedicelli* pollicares, erectiusculi, apice paulo incrassati. *Lobi calycis* sesquilineam longi, latiusculi. *Baccæ* globosæ, 2 lin. latæ, glabriusculæ. V. sicc.

33. A. ELLIPTICA. *Thunb. Nov. Gen. pars* viii. *Upsal.* 1795 (*ex Rœm. et Sch.*).

34. A. OXYPHYLLA (*Wall.! Catal. n.* 2291.), glabra, foliis ellipticis utrinque acutis margine magis punctatis, pedunculis terminalibus et axillaribus folio brevioribus, pedicellis laxe umbellatis, laciniis calycinis ovatis

subciliatis, lobis corollæ lanceolatis, stylo incluso. ♄. In ins. Penang (*Wall.!*).

Rami divergentes, lignosi. *Folia* 4—5 poll. longa, 15—48 lin. lata, regulariter elliptica, in petiolos 4—6 lin. longos angustata, rigidula, nitida, nervis lateralibus parallelis striata. *Inflorescentia* fere *A. humilis*, floribus tamen minoribus et minus numerosis. *Pedunculi* pollicares; *pedicelli* 4—8 lin. longi. *Baccæ* globosæ, 3 lin. longæ. V. sicc.

35. A. eugeniæfolia (*Wall.! Catal. n.* 2276.), foliis oblongo-lanceolatis basi acutis apice acuminatis coriaceis nervis crassis arcuatis prope marginem, pedunculis axillaribus brevibus paniculatis multifloris foliis multo brevioribus, pedicellis et calyce velutinis, laciniis calycis et corollæ ovato-acutis, stylo exserto. ♄. In montibus Sillet (*Wall.! ex De Silva*).

Folia 3—6 poll. longa, 1—2 poll. lata, longe acuminata, in petiolos 3—4 lin. longos basi angustata, ubique punctata, nervis ut in *A. divergente. Paniculæ* axillares, multifloræ. *Corolla* calyce tripla, subcampanulata. *Antheræ* subsessiles, connectivo acuminato. V. sicc.

36. A. arborescens (*Wall.! Catal. n.* 2289.), glabra, foliis oblongo-lanceolatis acutis coriaceis, pedunculis axillaribus elongatis rigidis, paniculis laxis foliis brevioribus, pedicellis longis, lobis calycinis ovato-acutis. ♄. In montibus Taong-Dong dictis, regni Burmanici (*Wall.!*).

Rami crassi, veteriores cinerascentes cicatrisati et tuberculati, juniores læves. *Folia* 5—7 poll. longa, 1½—2 poll. lata, plus minusve acuta, valde coriacea, nervis lateralibus parum eminentibus, petiolo semipollicari, punctis parum distinctis. *Pedunculi* 3—4 poll. longi, erecti, sæpe compressi, læves. *Pedicelli* pollicares. *Lobi calycini* (post anthesin) ampli, 2 lin. longi. *Baccæ* globosæ, 3 lin. latæ. V. sicc.

37. A. Amherstiana, foliis oblongis acutis, pedunculis terminalibus pedicellisque velutinis, floribus umbellulatis, laciniis calycinis ovatis obtusis ciliatis et dorso velutinis, lobis corollæ profunde partitæ ovato-acutis, stylo incluso. ♄. Prope urbem Amherst, provinciæ Martabaniæ, olim Burmanorum (*Wall.!*). A. reflexa. *Wall.! Catal. n.* 2282, partim.

Arbuscula ramis apice sericeo-velutinis fulvisque. *Folia* 6—8 poll. longa, 1½—2 poll. lata. *Pedunculi* 2, in specimine, subterminales, sesquipollicares. *Flores* numerosi, umbellati. *Alabastra* ovoidea, acuta, 3 lin. longa.

Mixta in herbario ampl. cœtus Indiæ Orientalis cum aliâ specie (*A. reflexa, n.* 47.) cujus habitum et inflorescentiam habet, sed a quâ differt foliis basi paulo magis angustatis, glaberrimis, pedunculis pedicellis et calyce velutinis cinerascentibus, nec dense hispidis, laciniis calycinis latioribus obtusis.

38. A. PAUCIFLORA. *Herb. Heyn.! Roxb. Fl. Ind.* ii. *p.* 279. *Wall.! Catal. n.* 2270.

39. A. TENUIFLORA. *Blume, Bijtr. tot Fl. Nederl. Ind. p.* 686.

40. A. NUTANS. *Nob.* A. punctata. *Blume, ibid. p.* 687. non *Lindl.*

41. A. MARGINATA. *Blume, ibid. p.* 688.

42. A. LÆVIGATA. *Blume, ibid. p.* 690.

43. A. OBOVATA. *Blume, ibid. p.* 688.

44. A. CYMOSA. *Blume, ibid. p.* 689.

45. A. OBLONGA, foliis oblongis acuminatis punctatis, pedunculis multo foliis brevioribus subterminalibus, pedicellis umbellatis paucifloris ut pedunculi glabris, lobis calycinis ovatis obtusis subciliatis. Circa Tavoy (*Wall.! ex Gomez*). A. attenuata. *Wall.! Catal. n.* 2286, partim: vid. supra, *n.* 32.

Folia 4—5 poll. longa, 12—18 lin. lata, in petiolum 4—5 lin. longum angustata, glaberrima, nervis in herbario bene distinctis, superne nitida, punctis crebris minimis. *Pedunculi* 6—8 lin. longi; *pedicelli* 3—5 lin. apice paulo incrassati, sæpe reflexi. *Calycis lobi* glanduloso-ciliati, ½ lin. longi. *Alabastra* acuta. *Baccæ* globosæ, 2½ lin. latæ, glabriusculæ. V. sicc.

46. A. OXYANTHA (*Wall.! Catal. n.* 2275.), foliis lanceolatis utrinque acuminatis tenuibus, floribus axillaribus paucis, pedunculis unifloris filiformibus petiolo subæqualibus, laciniis calycinis lanceolatis subulatis subciliatis, corollæ lobis elongatis valde acuminatis. ♄. In montibus Sillet (*Wall.! ex De Silva*).

Folia 3—4 poll. longa, 1—1½ poll. lata, in herbario viridia, ubique punctata, in petiolos 3 lin. longos angustata, nervis subtus prominulis. *Pedicelli* graciles, 3—4 lin. longi, glabri, uniflori, e bracteis imbricatis subulatis minimis subvelutinis axillis foliorum superiorum nascentes, pauci, fragiles, ideo sæpius solitarii. *Alabastra* valde acuminata. *Stamina* 5, filamentis

brevissimis, antheris acuminatis liberis. *Stylus* inclusus.—Species anomala. V. sicc.

** Folia pilosa.

47. A. reflexa (*Wall.! Catal. n.* 2282, partim), foliis oblongis acutis superne glabris subtus pubescentibus, pedunculis subterminalibus reflexis paucis foliis multo brevioribus pubescentibus, pedicellis umbellatis cum laciniis calycinis ovato-acutis dense pilosis. ♄. In Martabaniâ (*Wall.!*).

Rami apice hispidi fulvique, pilis lente articulatis. *Folia* sparsa, 4—7 poll. longa, 1½—2½ poll. lata, basi satis abrupte in petiolum hispidum 4—5 lin. longum angustata, subtus pubescentia, pilis brevissimis sub lente solum perspicuis. *Pedunculi* semipollicares, duo tantum apice rami in nostro specimine. *Bracteæ* basi pedicellorum subulatæ, 2 lin. longæ. *Pedicelli* 3 lin. longi. *Lobi calycini* lineam longi. *Alabastrum* acuminatum. *Corolla fructus*que desunt.

Species cujus unicum specimen vidi, cum A. amherstiana, *n.* 37., ejusdem regionis, in herbario ampl. cœtus Indiæ Orientalis et in Catalogo Wallichiano mixta.

48. A. grandifolia, foliis oblongis amplis cuspidato-acutis superne glabris subtus pilosis, ramis et petiolis hispidis, pedunculis subterminalibus foliis multo brevioribus puberulis rigidis, pedicellis umbellatis, laciniis calycinis lanceolatis acutis subciliatis. ♄. Circa Tavoy, olim regni Burmanici *Wall.! ex Gomez*). A. macrophylla. *Wall.! Catal. n.* 2290. non *Blume.*

Folia 5—9 poll. longa, 3—4 poll. lata, in petiolum 4—8 lin. longum angustata, tenuia, nervo centrali subtus hispidissimo, lateralibus pilosis parum eminentibus. *Pedunculi* pollicem longi; *pedicelli* 6—8 lin. *Pili* foliorum ramorumque sericeo-purpurascentes, sub lente articulati. *Laciniæ calycis* 2 lin. longæ, puberulæ. *Baccæ* ovoideæ, 3 lin. longæ, glabræ. V. sicc.

49. A. macrophylla. *Blume, Bijtr. tot Fl. Nederl. Ind. p.* 691. non *Wall.*

§ 2. Folia crenata, dentata vel serrata.

* Folia glabra.

50. A. serrata. *Pers.* Anguillaria serrata. *Cavan.! Icon.* 503.

51. A. PYRAMIDALIS. Anguillaria pyramidalis. *Cavan. Icon.* 502.

52. A. SPECIOSA. *Blume, Bijtr. tot Fl. Nederl. Ind. p.* 684.

53. A. SERRULATA. *Sw. Prodr. p.* 48.

54. A. FULIGINOSA. *Blume, Bijtr. tot Fl. Nederl. Ind. p.* 692.

55. A. GLABRATA. *Blume, ibid.*

56. A. MACROCARPA. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 277. *Catal. n.* 2267.

57. A. MEMBRANACEA (*Wall.! Catal. n.* 2288.), glabra, foliis approximatis oblongo-lanceolatis acuminatis basi longissime attenuatis irregulariter crenulatis membranaceis, pedunculis axillaribus foliis quadruplo brevioribus, pedicellis approximatis brevibus, alabastris obtusis, laciniis calycinis ovato-acutis lobis corollæ subæqualibus, stylo incluso. ♃ ♄. In montibus Sillet (*Wall.! ex De Silva*).

Suffrutex ramis sublignosis cylindricis crassis medullâ farctis. *Folia* 4—5 poll. longa, 12—15 lin. lata, petiolis semipollicaribus, crenulata (exsiccatione forsan?), ubique punctata, nervis bene distinctis, foliis *A. oxyanthæ* similia. *Pedunculi* numerosi, pollicares, tenues, sæpe reflexi. *Flores* minimi, laxe fasciculati, pedicellis 1—3 lin. longis. *Laciniæ calycis* et *corollæ* vix lineam longæ. V. sicc.

58. A. WALLICHII, foliis obovatis acutis vel obtusis in petiolum marginatum angustatis repande crenulatis, pedunculis axillaribus foliis dimidio brevioribus ut pedicelli pilosiusculis, floribus laxe racemosis, laciniis calycinis ovato-acutis subciliatis, lobis corollæ ovato-acuminatis, antheris subsessilibus obtusiusculis, stylo incluso. ♃ ♄. In ditione Burmanorum ad ripas Irrawaddy et Atran (*Wall.!*). A. sanguinolenta. *Wall.! Catal. n.* 2287. non *Blum.*

Humilis, suffruticans, ramis crassis vix lignosis. Rami juniores foliaque succo sanguinolento scatentes. *Folia* 4—5 poll. longa, 2 poll. sæpius lata, crassiuscula. *Pedunculi* et *pedicelli* pilosiusculi, interdum ex basi plantæ, 1—2 poll. longi; bracteis acutis.

59. A. JAPONICA. *Hornstedt, Diss. Nov. Plant. Gen., pars* i. *pp.* 6, 7. *cum Ic. Thunb. Fl. Jap. p.* 95. *tab.* 18.

60. A. GLABRA. Bladhia glabra. *Thunb. Fl. Jap. p.* 350.

61. A. PUMILA. *Blume, Bijtr. tot Fl. Nederl. Ind. p.* 688.

62. A. crispa. Bladhia crispa. *Thunb. Fl. Jap. p.* 97. *Banks, Ic. Kæmpf. tab.* 7. A. elegans. *Andr. Bot. Rep. tab.* 623. A. crenata. *Roxb. Fl. Ind.* ii. *p.* 276. *Wall.! Catal. n.* 2262. A. glandulosa. *Blum.*? non *Roxb.*

β. corollâ albâ ex rubro punctatâ. A. crenata. *Sims, Bot. Mag. tab.* 1950. A. lentiginosa. *Ker, Bot. Reg. tab.* 553.

γ. corollâ albâ. A. crenulata. *Lodd. Bot. Cab. tab.* 2.

Specimina albiflora coluit Loddiges quæ postea florem album ex purpureo punctatum præbuerunt. A. elegans *Bot. Rep.* florem roseum habet, ut suspicor de plantâ Roxburghii et Wallichii, quod ex herbario non affirmare possum. An duæ species?

Hab. in Penang et Singapore (*Roxb. et Wall.!*), in Javâ (*h. Deless.!*), Japoniâ (*Kæmpf.*, *Thunb.*), et Chinâ (*Lodd.*).

63. A. pentagona. A. quinquegona. *Blume, Bijtr. p.* 689.

64. A. punctata. *Lindl. Bot. Reg. tab.* 827.

** Folia pilosa.

65. A. crenulata. *Vent. Choix de Plant. tab.* 5. A. lateriflora. *Sw.*? In Porto-Ricco (*Bertero! in h. DeC.*), in Mexico inter Tampico et Real del Monte (*Berlandier! in h. DeC.*).

Var. β. foliis coriaceis non pellucido-punctatis subtus valde pilosis. Ex hort. Paris.

Variat foliis subintegris vel plus minusve repandis et pilosis.

66. A. cubana, foliis ovato-oblongis obtusiusculis undulatis superne glabris subtus pilosiusculis, paniculis terminalibus ramosis foliis subæqualibus, pedunculis ferrugineis, laciniis calycinis acutis, lobis corollæ 5-partitæ lineari-lanceolatis patentibus velutinis. ♄. In Cubâ (*Ram. de la Sagr.! in h. DeC.*).

Rami extremi et *pedunculi* velutini. *Folia* 2—3 poll. longa, 8—15 lin. lata, subintegra, obtusa vel acutiuscula, in petiolum 4—6 lin. longum angustata, subtus glabra vel pilosiuscula, pilis stellatis. *Panicula* multiflora. *Alabastra* ovoideo-conica, angulosa, velutina. *Flores* ut in *A. crenulatâ*,

lobis corollæ tamen angustioribus, margine non cinerascentibus. Ab eâ specie vix differt, nisi foliis minoribus obtusis minus repandis.

67. A. Icara (*Wall.! Catal. n.* 2264. ex *h. Hamilt.!*), foliis oblongo-lanceolatis basi acuminatis apice acutis denticulatis superne pilosiusculis subtus glabris pallidioribus, paniculis ramosis subterminalibus foliis subæqualibus, pedunculis pedicellis umbellatis floribusque velutinis, laciniis calycinis subulatis, corollæ lobis ovato-acutis. Tab. VII. ♄. In Bengaliâ circa Bhatgong et Mateabo (*Hamilt.!*).

Rami lignosi. *Folia* semipedalia, 1—2 poll. lata, superne primo aspectu glabra sed tamen pilosiuscula pilis simplicibus ubique sparsis, subtus glabra punctis crebris minimis adspersa, denticulis numerosis acutis. *Paniculæ* elongatæ axillis foliorum superiorum ; bracteis linearibus 3—4 lin. longis ; pedunculis alternis axillis bractearum illis triplo quadruplove longioribus, pedicellis umbellatis 3 lin. longis bracteolis verticillatis basi circumdatis. *Laciniæ calycis* angustiores quam in congeneribus. *Antheræ* ovoideæ, acuminatæ, lobis corollæ breviores, filamentis multo longiores. *Ovarium* cylindricum. *Stylus* filiformis, staminibus duplo longior. V. sicc.

68. A. odontophylla (*Wall.! Catal. n.* 2279.), foliis lanceolato-oblongis utrinque acutis longe petiolatis argute dentatis puberulis, racemis axillaribus foliis multo brevioribus, pedicellis brevibus alternis ut pedunculi velutinis, lobis calycinis ovato-acutis ciliatis et puberulis, corollæ profunde partitæ lobis ovàto-acutis. Tab. VI. ♃ ♄. A. pavonina *herb. Hamilt.!* In Bengaliâ, versus Sillet (*Wall.! ex De Silva*) et circa Gualpara (*Hamilt.*).

Rami non lignosi, medullâ farcti, adscendentes, teretes, velutini. *Folia* 4—6 poll. longa, 2—2½ poll. lata, petiolis pollicaribus. *Racemi* 1—3 poll. longi, pedicellis 3 lin. longis tenuibus, bracteis subulatis angustissimis 1—3 lin. longis. *Alabastra* acuminata. *Lobi calycis* lineam longi, corollâ duplo breviores. *Antheræ* triangulares, subacutæ, filamentis multo longiores. V. sicc.

69. A. mollis. *Blume, Bijtr. tot Fl. Nederl. Ind. p.* 689.

70. A. tavoyana, ramis extremitate pubescentibus, foliis oblongo-lanceolatis utrinque acuminatis superne glabris subtus pilosis et valde punctatis subcrenulatis tenuibus, pedunculis lateralibus simplicibus velutinis folio

subbrevioribus, pedicellis umbellatis, laciniis calycinis lineari-lanceolatis acuminatis extus pilosis. ♄. Circa Tavoy, olim regni Burmanici (*Wall.! ex Gomez*). A. villosa. *Wall.! Catal. n.* 2280, B.

Ab *A. villosâ* (*Wall.* 2280, A.) differre videtur foliis paulo majoribus (4—6 poll.), subtus pilosis (pilis non adpressis et bene perspicuis), oculo nudo punctatis, tenuioribus, margine magis revolutis et crenulatis; pedunculis paulo brevioribus. Folia nonnunquam ex apice pedunculorum nascuntur. Corolla ignota. Bacca globosa, pilosiuscula, lobis calycinis obtecta. Pili, ut in *A. villosâ*, articulati. V. sicc.

71. A. VILLOSA. *Roxb. Fl. Ind.* ii. *p.* 274. *Wall.! Catal. n.* 2280, A.

72. A. PUSILLA. Bladhia villosa. *Thunb. Fl. Jap. p.* 96. *tab.* 19.

73. A. VESTITA. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 274., *Catal. n.* 2281

Sectio 2. *Hymenandra.*

Antheræ connatæ. *Stylus* staminibus longitudine subæqualis. *Stigma* punctiforme. *Bracteæ* pedicellis multo breviores.

74. A. HYMENANDRA. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 282. *Wall.! Catal. n.* 2266.

75. A. GLANDULOSA. *Roxb. Fl. Ind.* ii. *p.* 276. *Wall.! Catal. n.* 2265.

Sectio 3. *Micranthera.*

Filamenta elongata. *Antheræ* liberæ filamentis multo breviores. *Stylus* staminibus non longior, subulatus.

§ 1. Stylus staminibus subæqualis. Antheræ effœtæ horizontales contortæ.

76. A. CORIACEA (*Sw. Prodr. p.* 48., *Fl. Ind. Occ.* i. *p.* 470.), glabra, foliis oblongis obtusiusculis integerrimis coriaceis, paniculâ terminali pyramidali foliis sublongiore, lobis calycinis ovatis obtusiusculis, corollæ 5-partitæ lobis ovato-acutis reflexis, filamentis apice tubi corollæ insertis subconnatis antheris sublongioribus. ♄. In Guadaluppâ et Hispaniolâ (*Bertero! in h. DeC.*). Flore et inflorescentiâ ad Walleniam accedens.

77. A. HAMILTONII. A. obovata. *Hamilt. Prodr. Fl. Ind. Occ. p.* 26. non *Blume*, An a præcedente diversa?

78. A. EXCELSA (*Chr. Smith! in h. DeC. et Deless.*), foliis ovato oblongis ob-

tusiusculis mediocribus integris glabris, pedunculis axillaribus, pedicellis umbellatis pedunculis longioribus, laciniis calycinis acutis glabris, alabastris acutis, lobis corollæ 5-partitæ lanceolatis calyce triplo longioribus, staminum filamentis subulatis, antheris duplo longioribus. ♄. In Canariis, ubi vulgò *Aderno*, et in Maderâ (*Lowe!*). Pedunculis brevissimis ad Myrsines accedit.

§ 2. Stylus staminibus duplo brevior. Antheræ erectæ.

79. A. Lhotskya, glabra, foliis oblongis integris obtusiusculis punctatis, paniculis terminalibus et axillaribus folio brevioribus multifloris, pedicellis umbellulatis, calycis 5-fidi lobis acutis, corollæ profunde 5-fidæ infundibuliformis lobis oblongis, filamentis longitudine corollæ. ♄. In Brasiliâ, veris. circa Rio Janeiro (*Lhotsky! in h. DeC.*).

Arbor altitudine ignota. *Rami* cortice rugoso. *Folia* apice ramorum 2—3 poll. longa, 1—1½ poll. lata, obtusa vel acutiuscula, in petiolum marginatum angustata, tenuia, ubique punctulata, punctis nigricantibus. *Pedunculi* et *pedicelli* articulati, bracteis ovatis minimis caducis, pedicellis tenuibus 2 lin. longis. *Calyx* vix lineam longus. *Lobi corollæ* albidi, ex luteo maculati, sesquilineares, suberecti. *Filamenta* basi imæ corollæ inserta, filiformia, per anthesin accrescentia. *Antheræ* ovoideæ, filamentis breviores, medio affixæ, erectæ, luteæ. *Ovarium* superum. *Stylus* filiformis, subulatus. V. sicc.

80. A. racemosa. *Spreng. Syst.* i. *p.* 661.

81. A. lepidota. *Kunth in Humb. et Bonpl. Nov. Gen.* iii. *p.* 247. Longitudo styli ignota.

Sectio 4. *Tyrbæa.*

Flores laxè paniculati pedunculis alternis. *Bracteæ* amplæ, caducæ, floribus alternis subsessilibus majores.

82. A. bracteosa, foliis oblongis subacutis integris coriaceis, bracteis ovato-acutis, lobis calycis et corollæ ovato-acutis, antheris ovoideis horizontalibus filamento minoribus, stylo staminibus sublongiore. ♄. In Mexico. Tyrbæa. *Mocino et Sesse, Icon. Mexic. ined.*

Arbor ramis lignosis fuscis. *Folia* approximata, alterna, 3—4 poll. longa, 1—1½ poll. lata, plus minusve acuta in petiolum brevem submarginatum angustata. *Panicula* foliis longior, ramosa, laxa, pedunculis seu ramis inferioribus subpendulis fructiferis bracteis caducis, superioribus floriferis spiciformibus 4—8-floris erectis, floribus alternis solitariis apice approximatis. *Bracteæ* ovato-acutæ, 6—8 lin. longæ, alabastra obtegentes, sessiles, integræ, fuscæ, per anthesin caducæ. *Calyx* 5-fidus, tubo ovoideo, lobis glabris. *Corolla* albo-rosea, calyce dimidio longior, tubo cylindrico, lobis reflexis. *Stamina* lobis corollæ opposita, horum basi inserta; filamenta capillacea lobis corollæ sublongiora; antheræ ovoideæ, minimæ, horizontales, luteæ. *Stylus* subulatus. *Bacca* brevipedicellata, ovato-globosa, stylo terminata, in icone viridis. *Semen* pericarpio conforme, ovoideum, acutiusculum. (Ex icone.)

83. A. esculenta (*Pav.! in h. Moricand*), foliis ovato-oblongis subacutis integris coriaceis glabris punctatis, petiolis marginatis, paniculâ foliis longiore, bracteis ovatis obtusiusculis, lobis calycinis ovato-acutis ciliatis, antheris filamento longioribus triangularibus acutis, stylo subulato incluso. ♄. In Americâ meridionali.

Folia 3—4 poll. longa, 1—1½ poll. lata, in petiolos marginatos angustata, subtus punctis resinosis crebris nigricantibus notata. *Flores* omnes nondum aperti. *Panicula* ramosa, ramis erectiusculis, oculo armato subvelutinis. *Bracteæ* amplæ, 3—6 lin. longæ, erectæ, flores amplectentes, fuscæ. *Lobi calycis* imbricati, subinæquales, lineam longi. *Corolla* nondum aperta obtusa, intra lobos calycis. *Lobi* ovati, glabri, maculati. *Filamenta* basi corollæ inserta, lobis corollæ opposita, tenuia. *Antheræ* filamentis multo longiores, erectæ, rigidæ. *Ovarium* globosum. V. sicc. in *h. Moric.*

Vix differt a præcedente, tamen stamina diversissima, ex icone supra citatâ.

84. A. fœtida. *Rœm. et Sch. Syst.* iv. *p.* 803., ex plantâ *Humb. in h. Willd.*

Ardisiæ non satis notæ.

85. A. bahamensis. Heberdenia excelsa *Herb. Banks.* ex *Gærtn.* Anguillaria bahamensis. *Gærtn. Fruct.* i. *p.* 372. *tab.* 77. *f.* 1.

86. A. LINEATA. *Rœm. et Sch. Syst.* iv. *p.* 804., *ex h. Willd.*

87. A. DIVARICATA. *Ibid.*

88. A.? PARVIFOLIA. *Ibid.*

89. A.? PARASITICA. A. parasitica. *Sw. Prodr. p.* 48.

90. A.? ARGUTA. A. arguta. *Kunth in Humb. et Bonpl. Nov. Gen.* iii. *p.* 247.

91. A. OVATA. *Thunb. Nov. Gen. pars* viii., *Ups.* 1795, *ex Rœm. et Sch.*

X. EMBELIA.

Ribesioides. *Linn. Zeyl. n.* 403.

Embelia. *Juss. Gen. p.* 427. *Roxb. Fl. Ind.* ii. *p.* 285.

CHAR. *Calyx* 5-partitus. *Corolla* 5-partita, lobis æstivatione subvalvari. *Stamina* 5, lobis corollæ longitudine subæqualia. *Antheræ* ovoideæ, filamentis liberis multo breviores, per anthesin horizontales. *Ovarium* superum, 1-ovulatum (ex *Wall.*). *Stylus* staminibus brevior. *Stigma* capitellatum. *Bacca* globosa. *Semen* unum.

VEGET. Frutices asiaticæ, sæpius scandentes; petiolis nonnunquam denticulatis; racemis axillaribus vel terminalibus, simplicibus vel ramosis; floribus parvis; alabastris obtusis; pedunculis et pedicellis alternis sæpius pilosis aut velutinis.

* Paniculæ vel racemi terminales.

1. E. RIBES. *Roxb. et Wall.! Fl. Ind.* ii. *p.* 284., *Catal. n.* 2304. Ribes. *Burm.! Ind.* lxii. *tab.* 23. Fragmentum vidi ex herb. Burmann, cum alterâ specie omnino diversâ mixtum, quod a speciminibus cl. Wallich differt solum folio obtuso. In eo charactere admodum variant omnes Embeliæ.—*Hab.* in Sillet (*Wall.!*), Golgipori (*Hamilt.!*), Penang (*Wall.!*), et Singapore (*Wall.!*). In spec. e Singapore fructus cylindracei adsunt, insectus punctione.

2. E. CANESCENS. *Wall.! ex Jack in Roxb. Fl. Ind.* ii. *p.* 292. *Catal. n.* 2311.

** Racemi axillares.

3. E. FERRUGINEA (*Wall.! Catal. n.* 2310.), ramis junioribus et pedunculis tomentosis ferrugineis, foliis ovato-rotundatis integris coriaceis superne glabris, subtus et petiolo stellatim pilosis rubiginosis. ♄. Ad ripas Irrawaddi.

Rami seniores lignosi albidi, juniores pilosi et rubiginosi. *Folia* late ovata, 5-pollicaria, obtusa vel acuta, superne nervis subvelutinis, petiolis semipollicaribus pilosis non alatis. *Flores* desunt in spec. *Bacca* globosa, vix lineam longa, teres, in herbario nigricans. V. sicc.

Ab *E. villosa* differt cortice non maculato, ramis junioribus petiolis et paginâ inferiore foliorum magis pilosis et rubiginosis.

4. E. villosa. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 289. *Catal. n.* 2313. E.? reticulata *Wall.! Catal. n.* 6521. ♄. Circa Rajmahl et Tavoy (*Wall.!*). Variat foliis late obovato-rotundatis valdeque pilosis, vel ovato-acutis parvis glabriusculis. Pili parietibus interioribus donati.

5. E. picta (*Wall.! Catal. n.* 2302.), ramis et pedunculis velutinis ferrugineis, foliis ovalibus glabriusculis remote denticulatis, racemis axillaribus foliis longioribus simplicibus, calyce et corollâ velutinis. ♄. In Gongachara et Goalpara Indorum (*Hamilt.!*). Samara picta, *herb. Hamilt.!*

Rami pilosi, ex albo maculati. *Folia* 3—5 poll. longa, 2—3 lata, superne glabra, subtus glabriuscula et pallidiora, punctis minimis nigris remotè notata, in petiolum semipollicarem angustata, plus minusve cuspidato-acuminata vel obtusa, integra vel remotè denticulata. *Racemi* numerosi, elongati. *Flores* ut in *E. villosâ.* V. sicc.

6. E. floribunda. *Wall.! in Roxb. Fl. Ind.* ii *p.* 291. *Catal. n.* 2305, A.

β. macrophylla ; foliis longioribus. E. floribunda ? *Wall.! Catal. n.* 2305, B.

Agnoscitur præcipue punctis majoribus prope marginem foliorum seriatim dispositis. α. in Nepaliâ, β. in Sillet.

7. E. vestita. *Roxb. Fl. Ind.* ii. *p.* 288. *Wall.! Catal. n.* 2306.

8. E. nutans. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 290. *Catal. n.* 2303.

9. E. robusta. *Roxb. Fl. Ind.* ii. *p.* 287.

10. E. parviflora (*Wall.! Catal. n.* 2307.), foliis bifariis parvis approximatis ovato-acutis basi obtusis integris glabris nitidis, racemis axillaribus foliis brevioribus, floribus parvis dense umbellulatis, pedunculis velutinis. ♄. In Sillet.

β. major : foliis oblongis utrinque acutis majoribus subdentatis.

11. E. UROPHYLLA (*Wall.! Catal. n.* 2309.) glaberrima, foliis ovato-lanceolatis utrinque acuminatis integris coriaceis nitidis, pedunculis simplicibus elongatis foliis subæqualibus, pedicellis brevissimis. ♄. Singapore (*Wall.!*).

Rami lignosi, non crassi. *Folia* 2—3 poll. longa, 1—1½ poll. lata, nitida, non punctata, basi sensim angustata, apice abrupte angustata, id est longe cuspidata. *Pedunculi* nonnunquam basi ramosi, bracteis tenuissimis vix lineam longis alternis stipati. *Flores* axillis bractearum subsessiles, axillâ cujusque bracteæ solitarii, minimi. *Alabastra* obtusa, nimis juniora solum vidi. V. sicc.

Species dubiæ.

12. E.? TSJÉRIAM-COTTAM. Tsjeriam-Cottam. *Rheed. Malab.* v. *p.* 21. *tab.* 11. Basal, *n.* 2. *Lam. Dict.* i. *p.* 381. Ardisia? Tsjeriam-Cottam. *Rœm. et Sch. Syst.* iv. *p.* 518.

13. E.? BASAAL. Basaal. *Rheed. Malab.* v. *p.* 23. *tab.* 12. *Lam. Dict.* i. *p.* 381. *n.* 1. Ardisia? Basaal. *Rœm. et Sch. Syst.* iv. *p.* 517.

XI. CHORIPETALUM.

Myrsines dubiæ. *Wall.*

CHAR. *Calyx* 4-fidus. *Corolla* 4-petala! petalis separatim cadentibus! *Stamina* 4, petalis opposita, imâ basi cum illis connata. *Antheræ* filamentis breviores. *Stylus* filiformis, petalis brevior. *Ovarium* superum (an interdum abortivum? floribus tunc polygamis). *Drupa* globosa, monosperma.

VEGET. Plantæ asiaticæ, lignosæ. Folia alterna, integra, glabra, basi ovata et in petiolos longos angustata. Flores racemosi, pedunculis axillaribus, bracteis persistentibus alternis minimis. Inflorescentia ideo Embeliæ.

OBSERV. Species habitû satis similes, præcipue formâ et nervatione foliorum, adhuc in herbariis rarissimæ, floribus nondum optime notis. Corollâ polypetalâ, ut videtur, hoc genus vergit ad Rhamneas.

NOMEN a *χωρις separatim* et *πεταλον petalum.*

1. C. AURANTIACUM, foliis ovato-lanceolatis, pedunculis spiciformibus simplicibus foliis triplò brevioribus, petalis lanceolatis, staminum filamentis pe-

talis longioribus. ♄. In peninsulâ Indicâ (*Wall.! ex h. Heyn.*), Myrsine? aurantiaca. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 300. *Catal. n.* 2299.

Calycis lobi minimi, acuti, crassiusculi. *Petala* recurvata, 1—1½ lin. longa, maculis aurantiacis insignia. *Stamina* cum basi petalorum connata, iis longiora, filamentis tenuissimis, antheris lanceolatis parvis. *Stylus* filiformis, inclusus, an abortivus in speciminibus masculis? *Drupa* (ex *h. Wight.*) globosa 2 lin. lata, luteola, omnino *Myrsineæ*. *Semen* pericarpium implens. *Albumen* corneum. *Embryo* transversus, dorso superiorem partem seminis spectante. V. sicc.

2. C. undulatum, ramorum lenticellis callosis, foliis ovatis vel lanceolatis, utrinque acutis subundulatis tenuibus pellucido-punctatis, pedunculis foliis triplo brevioribus, petalis lanceolatis acutis glanduloso-ciliatis. ♄. In Napaliâ. Myrsine? undulata. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 299. *Catal. n.* 2301.

Specimina imperfecta solum vidi. *Calyx* 4-fidus, lobis ovato-acutis. *Petala* calyce triplo majora, patentia, minora quam in præcedente, duobus in æstivatione exterioribus et duobus interioribus, nonnunquam separatim deciduis. *Stamina* (ex *Wall.*) paulo supra basin petalorum inserta. *Ovarium* conicum. *Ovula* (ex *Wall.*) 2, medio placentæ centralis affixa. *Stigma* (ex *Wall.*) infundibuliforme. V. sicc.

Tribus III. MÆSEÆ.

Char. *Calyx* 5-lobus. *Corolla* 5-loba, æstivatione induplicatâ. *Stamina* 5, libera, basi corollæ inserta, inclusa, antheris ovoideis cordatis filamento longitudine subæqualibus. *Ovarium* adhærens, semi-inferum, multiovulatum. *Stylus* brevis. *Stigma* obscure 3—5-lobatum. *Semina* placentæ centrali affixa, numerosa, minima, angulosa. *Embryo* transversus.

Veget. Frutices vel arbores, asiaticæ aut africanæ. Folia alterna, nonnunquam pellucido-punctata, in eodem specimine variabilia. Racemi sæpius axillares, simplices vel ramosi, multiflori, floribus alternis brevipedicellatis, bracteis 2 suboppositis prope basin calycis.

Affin. Ad Primulaceas (Samolum præcipue) accedens.

XII. Mæsa.

Mæsa. *Forsk.*
Bæobotrys. *Forst. Nov. Gen.*
Sibouratia. *Aub. Dupet. Th. Nov. Gen. Madag. p.* 12.
Characteres supra dicti. Nomen veterius retinendum.

Species.

* Paniculæ vel racemi terminales.

1. M. paniculata (*Wall.! Catal. n.* 2320.) glaberrima, foliis late ellipticis utrinque acutis maximis dentatis, racemis axillaribus et terminalibus elongatis gracilibus. ♄. Tavoy olim Burmanorum (*Wall.! ex Gomez*).

Folia semipedalia, 3 poll. lata, membranacea, nitida, parum punctata, grosse et acute dentata, nervis perspicuis, petiolis tenuibus semipollicaribus. *Panicula* terminalis, semipedalis, parum ramosa, nuda, bracteolis alternis subulatis secundum pedunculos. *Flores* approximati. *Lobi calycis* ovato-acuti, glabri. *Corolla* tubulosa, calyce duplo longior. *Stamina* corollâ duplo minora. *Stigma* 3-lobum. *Bacca* ovoidea, vix lineam longa. V. sicc.

2. M. muscosa.
3. M. virgata.
4. M. latifolia.

} *Blume, Bijtr. tot Fl. Nederl. Ind. p.* 864—866.

** Racemi sæpius laterales.

5. M. ovata (*Wall.! Catal. n.* 2324.) glabra, foliis ovato-acuminatis subcordatis integris utrinque nitidis, racemis axillaribus elongatis gracilibus folio sublongioribus. Tab. IV. ♄. In Penang (*Wall.!*).

Rami teretes, non punctati. *Folia* 2—3 poll. longa, sesquipollicem lata, integerrima, sæpius cordata, membranacea, nervis distinctis. *Racemi* 2—4 poll. longi, floribus non numerosissimis. V. sicc.

A *M. ramentacea* vix differt, nisi racemis valde elongatis parum ramosis, pedicellis longioribus et baccis majoribus.

6. M. ramentacea. *Roxb. Fl. Ind.* ii. *p.* 233. *Wall.! Catal. n.* 2322. Bæo-

botrys lucida. *Wall.! Catal. n.* 2323. In Sillet, in regno Burmanico circa Rangoon, Moalmyne et Tavoy (*Wall.!*). In speciminibus e regno Burmanico folia 3-pollicaria sæpius, in illis e Sillet 4—5 poll. et in cultis 7.

7. M. missionis, glabra, foliis ovato-acuminatis integris, racemis folio brevioribus. ♄. In Indiâ Orientali (*Wall.! ex h. Madr.*). Bæobotrys? missionis. *Wall.! Catal. n.* 6523.

Fragmenta vidi, quæ sine dubio speciem mediam inter *M. ramentaceam* et *nemoralem* constituunt. *Rami* glabri. *Folia* 1—3 poll. longa, 6—15 lin. lata, longe acuminata, basi subacuta, minime dentata. *Flores* ut in *M. nemorali.*

8. M. nemoralis. Bæobotrys nemoralis. *Forst. Nov. Gen. p.* 22. *Vahl, Symb. p.* 19.? *Roxb. Fl. Ind.* ii. *p.* 232. *Wall.! Catal. n.* 2319. *Mart. Choix de Pl. du Jard. de Munich, p.* 6. *tab.* 6.
9. M. indica. Mæsa. *Forsk.* Bæobotrys indica. *Roxb. Fl. Ind.* ii. *p.* 230. *Wall.! ibid. et Catal. n.* 2318. Bæobotrys lanceolata. *Vahl, Symb.* i. *p.* 19. *tab.* 6. *Blume, Bijtr. p.* 865.? Mæsa Chisia. *Don, Prodr. p.* 148.?
10. M. dubia. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 235. *Catal. n.* 2317.
11. M. argentea. *Wall.! in Roxb. Fl. Ind.* ii. *p.* 233. *Catal. n.* 2316.
12. M. macrophylla. *Wall.! ibid. p.* 234. *Catal. n.* 2325. M. tomentosa. *Don, Prodr. p.* 148.?
13. M. mollis. *Blume, Bijtr. p.* 865.
14. M. mollissima. *Blume, ibid. p.* 866.

MYRSINEÆ GENERIS INCERTI.

1°. *Asiaticæ.*

1. Embelia? lucida. *Wall.! Catal. n.* 2315. *Rami* lignosi, cinerascentes. *Folia* alterna, ovalia, 2—4 poll. longa, 1—2 lata, utrinque acuta, coriacea, integra, margine subrevoluta, vix punctata, petiolis 3 lin. longis, transverse rugosis, nervis lateralibus prope marginem arcuatis. *Pedunculi* spiciformes, axillares, solitarii vel geminati, foliis quadruplo breviores, velutini, basi bracteolis imbricatis ovato-acutis obtecti, per totam longi-

tudinem bracteas alias dentiformes alternas gerentes. *Ovarium* sessile, axillis bractearum, ovoideum, ½ lin. longum, stigmate 2—5-lobo terminatum. *Flores* desunt in speciminibus maxime truncatis.—*Hab.* In Singapore (*Wall.!*).

Ex ovario, stigmate et bracteis circa basin pedunculorum Myrsine videtur, sed floribus alternis secundum pedunculos Embelias refert.

2. Embelia ? coriacea. *Wall.! Catal. n.* 2314. Fragmenta solum vidi. *Rami* lignosi, striati, nigricantes. *Folia* lanceolata, acuta, semipedalia, sesquipollicem lata, integra, glabra, coriacea, subtus glaucescentia nervo centrali eminente, lateralibus vix perspicuis, punctis minimis ubique sparsis. *Panicula* terminalis, elongata, longitudine foliorum, laxa, pedunculis et pedicellis pilosiusculis angulo recto divergentibus, bracteis 1—6 lin. longis. *Calyx* glaber. *Corolla* ? *Baccæ* sphæricæ, lineam latæ, punctatæ, glabræ. *Stylus* bacca brevior, stigmate capitato. *Folia* inflorescentia *Ardisiæ*, sed stigma capitellatum.—*Hab.* Verisimiliter in Penang (*Wall.*).

3. Myrsine ? umbellulata. *Wall.! Catal. n.* 2312. *Rami* lignosi, glabri. *Folia* 2—3 poll. longa, 8—12 lin. lata, oblonga, obtusa, glabra, subdenticulata, margine revoluta, crassiuscula, parum sed ubique punctata. *Flores* axillares, pedunculo communi crasso brevissimo bracteis ovato-acutis concavis subciliatis brevibus obtecto; pedicellis umbellatis, 3—4 lin. longis, filiformibus, glabris, numero 4—6. *Calyx* 5-partitus. *Corolla* ?—*Hab.* In Singapore (*Wall.!*). Inflorescentia Myrsines. V. sicc.

4. Ardisia ? spicata. *Wall.! Catal. n.* 2273. Habitus *Myrsinearum* diversissimus. *Rami* sublignosi, glabri. *Folia* longissime petiolata, glabra, petiolo 3 poll. longo basi per spatium semipollicare dilatato marginato subvaginante! limbo ovato utrinque acuto, 3—4 poll. longo, 1½—2½ poll. lato, repande crenulato, coriaceo, pellucide subpunctato, nervatione admodum singulari (pro Ordine) nervis lateralibus crebris parallelis distinctissimis usque prope marginem, nervulis minoribus transversis vix perspicuis. *Pedunculi* axillares, 1—3 poll. longi cum pedicellis floribusque subpuberuli, ramulos laterales multifloros vel unifloros alternos gerentes; pedicellis sæpius apice ramulorum umbellulatis, 2 lin. longis. *Bracteæ* basi pedicellorum et pedunculorum subulatæ, minimæ, caducæ. *Calyx* profunde 5-fidus, ½ lin. longus, lobis tenuibus subulatis erecto-incurvatis. *Corolla*

et *stamina* desunt in specimine. *Ovarium* superum, ovoideum, stylo filiformi calycis longitudine terminatum. *Bacca* globosa, 2 lin. crassa, monosperma, omnino *Ardisiæ.—Hab.* In Singapore (*Wall.!*).

Inflorescentia Choripetali. Ex petiolis basi dilatatis, Alismaceam simulantibus, genus prorsus novum suspicor.

5. ARDISIA DENTICULATA. *Blume, Bijtr. p.* 691.
6. MÆSA TETRANDRA. *Roxb. Fl. Ind.* ii. *p.* 233.

2°. *Africanæ* (An gen. *Badula*?).

7. ARDISIA MICROPHYLLA. *Rœm. et Sch. Syst.* iv. *p.* 804. *ex Dupet. Th. in h. Willd.*
8. ARDISIA FLORIBUNDA. *Ibid.*
9. ARDISIA PYRIFOLIA. *Ibid.*
10. ARDISIA ERYTHROXYLOIDES. *Ibid.*

3°. *Americanæ.*

11. MYRSINE SPICATA. *Kunth, in Humb. et Bonpl. Nov. Gen.* iii. *p.* 250. An Weigeltiæ nostræ affinis? differre tamen videtur formâ et magnitudine antherarum. Inflorescentia non Myrsines.
12. ARDISIA BRASILIENSIS. *Spreng. Syst.* i. *p.* 662.

4°. *Originis incertæ.*

13. ARDISIA MULTIFLORA. *Rœm. et Sch. Syst.* iv. *p.* 804. *ex h. Willd.*

SPECIES EXCLUSÆ.

1. ARDISIA TURBACENSIS. *Kunth, Nov. Gen.* iii. *p.* 245. Ex descriptione optimâ fructus seminisque Sapotea potius videtur.
2. BÆOBOTRYS ACUMINATA. *Wall.! Catal. n.* 2321. Corolla polypetala. Stamina petalis alterna. An circa Rhamneas investiganda?
3. EMBELIA? RAMOSA. *Wall.! Catal. n.* 6522. Folia impunctata. Petala 0. Stamina quinque, basi loborum perigonii inserta iisque opposita. Stigma discoideum dentatum. An versus Urticeas?

4. Ardisia acerosa *Gærtn.* est Cyathodes acerosa *R. Brown.*
5. Ægiceras minus *Gærtn.* est Connarus santaloides *Vahl, ex Kœnig.*
6. Myrsine ? theæfolia *Wall.! Catal. n.* 6391. non est Myrsinea, nam stamina sunt lobis corollæ alterna.

GENERA EXCLUSA.

1. Opilia. *Roxb.* Specimen vidi a clar. Wallich donatum, quod *Groutiæ Perrott. et Guill. Fl. Seneg.* i. *p.* 100. *tab.* 22. simillimum, ut monent clar. auctores, ad ordinem Olacinearum retulerunt.
2. Samara. *Linn.* non *Sw.* Cornus zeylanica. *Burm.! Zeyl. tab.* 76. Ad Rhamneas referenda cum celeb. Jussieu.
3. Clavija. *Ruiz et Pav. Prodr. Fl. Peruv. p.* 131. *Ic.* 30. *Desfont. Nouv. Ann. Mus.* i. *p.* 398. *cum icone.* Genus a clar. Desfontaines optime descriptum, sed, ut Theophrasta, inter Sapoteas potius locandum, propter fructum et præcipue appendices corollæ. Antheræ non solum connatæ, sed extrorsæ (in Clavijâ), aliquid novum in hisce ordinibus præbent. An, præeunte cl. Bartling, ordo distinctus Theophrasteacearum instituendus?

TABULARUM EXPLICATIO.

Tab. IV. *Mœsa ovata.* Wall. Fig. 1. ramus cum flore; 2. flos corollâ ademptâ; 3. corolla; 4. drupa; 5. drupa pericarpio superne adempto seminibus placentæ appressis; 6. semen, ubi umbilicus in *a.*

V. *Badula Sieberi.* Alph. DeC. Fig. 1. pedicellis cum flore et bracteâ; 2. flos; 3. corolla aperta; 4. calyx auctus corollâ caducâ; 5. facies interna staminis; 6. ovarium longitudinaliter sectum; 7. pagina inferior folii; 8. folium majus ex altero specimine.

VI. *Ardisia odontophylla.* Wall. ex h. Hamilt.

VII. *Ardisia Icara.* Wall. ex h. Hamilt. Fig. 1. pagina inferior folii superioris; 2. pagina inferior folii inferioris; 3. flos; 4. flos corollâ

ademptâ; 5. pedunculus cum pedicellis umbellatis; 6. corolla aperta.

TAB. VIII. *Ardisia neriifolia.* Wall. Fig. 1. pagina inferior folii; 2. et 3. alabastra; 4. flos apertus; 5. anthera secta; 6. anthera interne visa; 7. flos longitudinaliter sectus; 8. ovarium cum stylo; 9. sectio geometrica floris; *a.* lobi calycis; *b.* lobi corollæ; *c.* stamina; *d.* pistillum.

F. [illegible] del. [illegible] Allen sculp.

[illegible]

Heyland del. D. Allen sculp.

Badula Sieberi.

Heyland del. B. Allen sculp.

Ardisia odontophylla.

Heyland del.

D. Allen sculp.

Ardisia Icara

Heyland del.

D. Allen sculp.

Ardisia neriifolia

IX. *On the Modifications of Æstivation observable in certain Plants, formerly referred to the Genus* Cinchona. *By Mr.* David Don, *Libr. L.S.*

Read April 2nd, 1833.

THE various forms of æstivation appear to depend, in a great measure, on the relative position and development of the organs of reproduction; for we have remarked that the valvate kind occurs most frequently in such flowers as have those organs much enlarged and projecting beyond the mouth of the tube of the corolla, or where there exists any considerable inequality in length between the stamina and pistillum. It is much more varied in monopetalous than in polypetalous flowers; for, with the exception of a portion of the *Rutaceæ,* principally from New Holland and South America, the imbricate form is found generally to prevail in the latter class. In the valvate form the pieces, having their edges sloped in opposite directions, are nicely fitted together, affording not only the most complete protection to the delicate organs within, but also ample space for the development and subsequent impregnation of the stigma.

Among the monopetalous orders the form of æstivation is a character of such high value as oftentimes to afford the only palpable distinction to the limitation of families; but the extensive order *Rubiaceæ* presents a striking exception, examples of almost every modification of æstivation being afforded by it. The *Rubiaceæ* appear to constitute a grand central point of union (of which several may be remarked in the vegetable kingdom,) between the families of the monopetalous class; and possessing great diversity of form and character, they are found to partake more or less of the habit and structure of those orders to which they are related. The *Rubiaceæ* are intimately allied on the one hand to *Caprifoliaceæ* and *Valerianeæ,* and on the other to *Apocyneæ* and *Gentianeæ,* being distinguished from the two former by their symmetrical flowers, and from the latter by their adherent ovarium and undivided

style. All these families agree in having for the most part opposite and perfectly entire leaves.

As has already been remarked, the æstivation of corolla does not afford any permanent distinction between those families and *Rubiaceæ*; for in *Gardenia* we have the convolute æstivation of *Apocyneæ*, and the valvate and imbricate forms of *Caprifoliaceæ* and *Valerianeæ* occur in many genera of *Rubiaceæ*, and examples of each variety are to be found even in the species formerly included under *Cinchona*; thus, for example, in the *Cinchona grandiflora* and *rosea* of the *Flora Peruviana* it is imbricate, in *C. lanceolata* and the rest of the true *Cinchonæ* it is valvate, while in the West Indian species it is induplicate, and plaited in the *C. excelsa* of Roxburgh.

These variations of æstivation being found connected with other differences in structure, appear fully sufficient to entitle the abovementioned species to be regarded as constituting the types of so many distinct genera, the characters of which I shall now proceed to give.

CINCHONA.

Cinchonæ sp. *Auctt.*

Calyx 5-dentatus. *Corolla* tubulosa, limbo 5-loba, æstivatione valvatâ. *Antheræ* lineares, semiexsertæ. *Stigma* bilobum. *Capsula* bilocularis, septicido-dehiscens, polysperma. *Semina* peltata, samaroidea, margine membranaceo lacero.

Arbores (Amer. Merid.) *inflorescentiâ paniculatâ.*

* *Dehiscentiâ basilari.* Sp. normales.

1. C. lanceolata. *Ruiz et Pavon.* (Condaminea *Humb. et Bonpl.*) 2. cordifolia. *Mutis.* 3. rotundifolia. *Lamb. Ill. Cinch.* 4. ovalifolia. *Humb. et Bonpl.* 5. purpurea. *Ruiz et Pavon.* 6. pubescens. *Vahl.* 7. micrantha. *Ruiz et Pavon.* 8. Humboldtiana. *Lamb. l. c.* 9. glandulifera. *Ruiz et Pavon.* 10. hirsuta. *Ruiz et Pavon.* 11. stenocarpa. *Lamb. l. c.* 12. caduciflora. *Humb. et Bonpl.*

** *Dehiscentiâ terminali.* Sp. aberrantes.

13. macrocarpa. *Vahl.* 14. oblongifolia. *Mutis.* 15. magnifolia. *Ruiz et Pavon.* 16. Pavonii. *Lamb. l. c.* 17. acutifolia. *Ruiz et Pavon.*

In several species of the normal group of this genus the inner surface of the corolla is lined with a thick coat of hairs, analogous to the *pili collectores* which cover the branches of the style and the upper surface of the lobes of the corolla in many Compositæ.

COSMIBUENA. *Ruiz et Pavon.*

BUENA. *Persoon et DeCand.*

CINCHONÆ SP. *Auctt.*

Calyx 5-dentatus. *Corolla* tubulosa, limbo 5-loba, æstivatione imbricatâ. *Antheræ* oblongæ, exsertæ. *Stigma* bipartitum. *Capsula* subquadrilocularis, ab apice dehiscens, polysperma. *Dissepimenta* e duplici valvarum margine revoluto seminifero constituta. *Semina* peltata, angusta, ramentacea, extremitatibus fibrosis.

Arbores (Amer. Merid.) *inflorescentiâ cymosâ.*

1. C. obtusifolia. *Ruiz et Pavon.* 2. acuminata. *Ruiz et Pavon.*

In *Buena hexandra* of Pohl, which M. De Candolle has retained in this genus, the æstivation of corolla is valvate, and the structure of the capsule apparently the same as in *Cinchona*, to which I am disposed to refer it. Whether, as Pohl has suggested, the *Cinchona dichotoma* of Ruiz and Pavon ought to be referred to the present genus I am unable to decide, the specimens being without flowers, as represented in the plate of the *Flora Peruviana*, although the structure of the capsule is pretty nearly similar to that of *Cosmibuena*.

Having had no opportunity of examining any species of M. De Candolle's *Remijia*, I am uncertain whether it is entitled to be regarded as a distinct genus; but if it should prove different, other characters than those mentioned by that celebrated botanist must be looked for to distinguish it from *Cinchona*, as the peltate seeds are common to most of the genera now under consideration, and the description of the dehiscence of the capsule appears to have originated in a misconception of the account given by M. Auguste de St. Hilaire.

LASIONEMA.

Cinchonæ sp. *Auctt.*

Calyx 5-dentatus. *Corolla* tubulosa, limbo 5-loba, æstivatione imbricatâ. *Stamina* exserta: *filamenta* medio barbata: *antheræ* subrotundæ, peltatæ: *loculis* basi solutis. *Stigma* bilobum. *Capsula* bilocularis, medio loculicido-dehiscens, polysperma: *septo* completo. *Semina* peltata, exigua, samaroidea.

Arbor (peruviana) *inflorescentiâ paniculatâ.*

1. L. roseum.

Cinchona rosea. *Ruiz et Pavon, Fl. Peruv. et Chil.* ii. *p.* 54. *tab.* 199. *Lamb. Ill. Cinch. p.* 15.

EXOSTEMA. *Persoon.*

Cinchonæ sp. *Auctt.*

Calyx 5-dentatus. *Corolla* tubulosa, limbo 5-partita: *laciniis* lineari-elongatis, æstivatione induplicatis. *Stamina* exserta. *Antheræ* angustè lineares: *loculis* basi adnatis. *Stigma* indivisum. *Capsula* bilocularis, ab apice septicido-dehiscens, polysperma. *Semina* peltata, margine membranaceo integerrimo.

Arbores (præcipuè Ind. Occid.) *inflorescentiâ cymosâ.*

1. E. floribundum. 2. caribæum. 3. longiflorum. 4. corymbiferum. 5. angustifolium. 6. brachycarpum. 7. triflorum.

HYMENODICTYON. *Wall.*

Cinchonæ sp. *Roxb.*

Calyx 5-dentatus. *Corolla* tubulosa, limbo 5-fida, æstivatione plicatâ. *Antheræ* lineares, exsertæ. *Stigma* bilobum. *Capsula* bilocularis, loculicido-dehiscens, polysperma: *valvis* ventricosis, membranaceis. *Dissepimentum* completum. *Semina* peltata, membranaceo-alata.

Arbores (Ind. Orient.) *inflorescentiâ paniculatâ.*

1. H. excelsum. *Wall.* 2. thyrsiflorum. *Wall.*

LUCULIA. *Sweet.*

CINCHONÆ SP. *Wall.*

MUSSÆNDÆ SP. *Don, Prodr. Fl. Nep.*

Calyx 5-partitus: *laciniis* foliaceis. *Corolla* tubulosa, limbo 5-loba, æstivatione imbricatâ. *Stamina* subinclusa. *Antheræ* lineares. *Stigma* bipartitum. *Capsula* bilocularis, ab apice septicido-dehiscens, polysperma. *Semina* peltata, samaroidea, margine membranaceo lacero.

Arbores (nepalenses) *inflorescentiâ cymosâ, bracteatâ.*

1. L. gratissima. *Sweet.* (Cinchona *Wall.*). 2. cuneifolia (Mussænda *Prodr. Fl. Nep.*).

PINCKNEYA. *Mich.*

CINCHONÆ SP. *Poir.*

Calyx 5-partitus; *laciniâ alterâ* maximâ, foliaceâ, coloratâ. *Corolla* tubulosa, limbo 5-fida, æstivatione valvatâ. *Stamina* exserta. *Antheræ* peltatæ. *Stigma* emarginatum. *Capsula* bilocularis, septicido-dehiscens. *Semina* compressa, margine membranaceo-alata, basi emarginatâ inserta.

Arbor (Amer. Bor.) *inflorescentiâ cymosâ, bracteolatâ.*

1. P. pubeus. *Mich.*

It will be seen that the æstivation of corolla affords an important mark in distinguishing these groups, which are well defined and very natural. So little has this character been attended to among the *Rubiaceæ*, that even the illustrious Humboldt has included *Lasionema* among the synonyms of his *Cinchona Condaminea*, and M. De Candolle, who appears to have seen samples of it, still continues to place it in that genus, from which it is widely different, not only in the imbricate æstivation of its corolla, but also in the structure of the stamens and dehiscence of its capsule. The plate in the *Flora Peruviana* is a very faithful likeness of the plant, the structure of the stamens and the æstivation of corolla being there correctly represented.

X. *Additional Observations on the* Tropæolum pentaphyllum *of Lamarck.* *By Mr.* David Don, *Libr. L.S.*

Read March 18th, 1834.

In the account of this remarkable plant already given, at page 11, I omitted to notice several interesting facts, which an examination of living specimens in a more perfect state has enabled me to supply, and which greatly strengthen its claims to be regarded as the type of a distinct genus. The first character I shall have to notice is the persistent nature of the calyx, so different from that of *Tropæolum*, which is strictly deciduous. Not only is the calyx persistent, but it undergoes considerable changes during the progress of the fruit towards maturity, at which period it will be found to have increased very much both in size and thickness, its vitality continuing undiminished until the decay of the stem that supports it. In the advanced state, the tube or spur assumes a fleshy consistence, and is abundantly supplied with a honey-like fluid, its extremity being partially separated from the rest by a constriction, as if formed by a ligature, and finally withering and falling off, while the other parts remain in a healthy state.

The internal structure of the seeds differs materially from that of *Tropæolum*; the embryo is small and white, contained in a thin cartilaginous testa; and the cotyledons round and compressed.

I would therefore propose the following additions to the technical part of my former description.

Calyx persistens, demùm, fructu maturescenti, valdè auctus, carnosus: *calcari* infundibuliformi, infernè constricto, extremitate clavatâ melliferâ deciduâ! *Seminis testâ* cartilagineâ, albâ. *Embryo* parvus, albus: *cotyledones* subrotundæ, compressæ.

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MDCCCXXXV.

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XI. *A Commentary on the Fourth Part of the* Hortus Malabaricus. *By (the late)* Francis Hamilton, *M.D., F.R.S. and L.S.*

Read February 21st, and November 7th, 1826.

Mao, seu Mau, *p.* 1. *tab.* 1 et 2.

THE word *Mange*, which, the author says, is the name of this tree among the Indians, is of Malay origin, and was introduced by Garcias ab Horto, Acosta, and other early writers. These absurdly applied the *Mangka*, or *Manga*, of the Malays to the fruit, and called the tree *Mangifera*, which has been copied by modern botanists, although Rumphius properly called the genus *Manga*. His specific name *domestica* has been changed with equal want of propriety; for the name *indica* is equally applicable to every species of this genus. The Sanscrita name *Amra*, corrupted in the vulgar dialects of Gangetic India into *Am*, is the source of the word *Ambo*, used by the Brahmans of Malabar.

For one circumstance in Rheede's description I cannot account; and, as there can be no doubt that he knew the tree perfectly, and meant to describe it, this circumstance must be attributed to one of those errors into which even the most accurate are liable to fall. He says, "*folia bina, terna, aut quaterna simul ex eodem pediculo ramulis inhærent.*" This, converted into Linnæan language, would imply that they are *folia composita*; but this is perfectly erroneous. Another error, respecting the *stamina*, induced Linnæus to place this tree in the class *Pentandria*. Rheede says, *flores—quinque intus albicantibus fibris, flavescentibus apicibus dotatis—prædit*i. Now in ninety-nine flowers out of a hundred only one filament has an *anthera*, and I have never observed one flower in which all the five *stamina* were complete.

Ada maram, *p.* 5. *tab.* 3 et 4.

Maram annexed to *Ada* signifies tree; the Malabar name therefore is *Ada*,

or *Saros.* Rheede says that it grows in the woods of Malabar; but so far as I have observed, it seemed to me to have been always planted, and reared with care in the neighbourhood of villages or in gardens; and I suspect that it has been introduced from the great Oceanic Archipelago, where it would seem to be a spontaneous production, being, I suppose, the *Catappa silvestris* of Rumphius (see my Commentary on *Herb. Amb.* i. 175.). Both *Ada* and *Saros,* however, may be Malabar words peculiar to this plant, which would seem to imply its being indigenous; but *Jibe,* the name given to it by the Brahmans in Malabar, is also peculiar to that country; nor does there seem to be any Sanscrita name for this plant, which would imply its being an exotic lately introduced. At any rate, that it is so in the North of India I have no doubt, because in the vulgar dialects spoken there it is called *Budam,* or the *Almond-tree,* on account of its kernels being like those of the almond. This, although a very slight affinity, seems to have at first satisfied Nieuhof, Ray and Plukenet, who called the tree *Amygdalus indica* (*Alm.* 28.). Afterwards, indeed, on account of an absurd resemblance which he imagined to exist between its fruit and that of his *Prunifera Fago similis arbor Gummi Elemi fundens, figura et magnitudine Olivæ ex Insula Barbadensi* (*Alm.* 306; *Phyt. t.* 217. *f.* 4.), the last-mentioned author considered the *Ada maram* as nearly allied to this plant (*Mant.* 156.), which, although by no means the *Amyris Elemifera* of modern botanists, is certainly not the *Ada maram*; nor, if it produces *Gum Elemi,* is it likely to be even of the same natural order, none of the *Combretaceæ* producing odorous resins.

The elder Burman probably mentioned this tree under the following name, *Arbor indica, amara, nucleis Amygdali facie, Katappas Lusitanis, Samandara zeylonensibus,* as I shall endeavour to show when I treat of the *Hagam* (*Hort. Malab.* vi. 37.).

Rumphius (*Herb. Amb.* i. 175.) described two kindred species, the *Catappa domestica* and *silvestris*; and in the Appendix (176.) he notices the strong affinity which these have to the *Ada maram,* without mentioning to which of his kinds it is nearest. I have already stated that I think it is his *C. silvestris.* It was not introduced into the modern system until Linnæus published the *Mantissa,* in which he improperly called it *Terminalia Catappa* (see my Commentary on the *Herb. Amb.* i. 175.), a name retained by more modern botanists (*Enc.*

Méth. i. 348.; *Willd. Sp. Pl.* iv. 967.; *Hort. Kew.* v. 441.). I must here caution the young botanist against relying on the specific character given by these authors, however respectable. The leaves of the *Ada maram,* as well as of the *Catappa domestica,* have in general edges quite entire; and the real difference between them consists in the former being pubescent, and the latter smooth.

PANEM PALKA, seu PANAM PALCA, *p.* 9. *tab.* 5.

This tree, according to Commeline, was well known to John Bauhin, although it is alleged that his brother mistook its fruit for that of a *Palm.* Plukenet called it *Nux Myristica spuria* (*Alm.* 265.); and the elder Burman, copying Herman, called it *Nux Myristica, oblonga, Malabarica* (*Thes. Zeyl.* 172.). Under the name of *Myristica fructu inodoro,* Linnæus (*Fl. Zeyl.* 588.) placed it among his *Annihilatæ,* the explanation of which ("sunt plantarum zeylonensium nomina, quæ soni prætereaque nihil,") seems very little applicable to a plant, the female of which has been described and figured excellently by Rheede. As, however, this author did not mention the male, Linnæus, with the sexual system, was no doubt at a loss.

Among the more recent botanists this tree was first taken up by Thunberg (anno 1782), who called it *Myristica tomentosa.* M. Lamarck, overlooking this, or uncertain of what plant Thunberg meant, called it *Myristica malabarica* (*Enc. Méth.* iv. 388.), and distinguished it from the *Nux Myristica Mas* of Rumphius, with which Burman in his observation (*Herb. Amb.* ii. 25.) had confounded it. Rumphius himself, although he admitted a great similarity, pointed out several differences, which should have prevented Burman's mistake, especially as the latter had probably mentioned the *Nux Myristica Mas* of Rumphius under Herman's name, *Nux Zeylanica, Moschatæ rotundæ similis, oblonga* (*Thes. Zeyl.* 172.), which is probably the *M. Philippensis* of M. Lamarck.

Whether or not Gærtner could have seen M. Lamarck's account of this tree, first published in the Memoirs of the French Academy, I know not; but in the same year (1788), overlooking also the account of Thunberg, he described the fruit of the *Panem Palca* by the name of *M. dactyloides* (*De Sem.* i. 195. *t.* 41. *f.* 2.). Willdenow (*Sp. Pl.* iv. 870.) restored Thunberg's name, *M. tomentosa*; but falls into Burman's error in considering the *Nux*

Myristica Mas of Rumphius as the same. As he quotes both, I cannot take upon myself to determine which he really meant. If Thunberg did the same, the name *tomentosa*, being uncertain, should be altogether abandoned, as both M. Lamarck and Gærtner seem to have properly enough done.

Samstravadi, seu Samstravari, seu Caipa Tsjambu, *p.* 11. *tab.* 6.

The second name, which is that on the plate, is evidently an error of the engraver. The third implies the plant to be a species of *Tsjambu* or *Eugenia*, an opinion adopted by Commeline on no other authority than that of the natives, and these not the men of science; for the Brahmans call it *Sada Pali*, which Rheede says implies *frugifera arbor*. The vulgar Malabar generic name is not *Vadi*, as Burman would have it (*Fl. Ind.* 115.) by printing *Samstra vadi*. *Samstravadi* is evidently one word, and the prototype of a genus, as the following plant is called by the same name, with the specific term *Tsjeria* prefixed. Jussieu was therefore scarcely justifiable in calling (*Gen. Plant.* 361.) this genus *Stravadium*, which consists only of half a word.

Plukenet (*Mant.* 137.) suspected, but without being certain, that the *Samstravadi* might be his *Nuciprunifera Arbor, foliis densioribus, subtus argenteis floribus in prælongam spicam dispositis, fructu tetragono*; but, although nearly allied, the plants are no doubt different, as he might have concluded from Rheede's description, " folia superne colore atro-viridi splendentia, inferne viridi dilutiore."

Linnæus in the *Flora Zeylanica* (191.), still following the Hindu arrangement, called the plant of Rheede *Eugenia foliis crenatis, pomis ovatis, racemo longissimo*, which in the first edition of the *Species Plantarum*, and in Burman's *Flora Indica* (115.), became the *Eugenia racemosa*; but now the *Butonica sylvestris alba* of Rumphius (*Herb. Amb.* iii. 181. *t.* 116.) was added as synonymous. Although in the explanation of the plate Burman says that it represents the *Butonica sylvestris alba*, yet Rumphius himself called no plant by this name, but in the places quoted describes and figures the *Butonica terrestris alba*, a species totally different from the *Samstravadi*. Willdenow, however, (*Sp. Pl.* ii. 966.) leaves the synonyms just as he found them.

M. Lamarck (*Enc. Méth.* iii. 197.) continues to call this plant *Eugenia racemosa*, but notices its affinity to the *Barringtonia* or *Butonica*; and although

he properly rejects the *Butonica terrestris alba* as synonymous, he falls into an error equally great in calling it the *Butonica sylvestris* (*terrestris*) *rubra* (*Herb. Amb.* iii. 181. *t.* 115.) of Rumphius; for European botanists seem to have thought it necessary, as Rheede had described two *Samstravadis,* that these should be the same with the two *Butonicas* of Rumphius; whereas the latter does not describe the *Samstravadi,* nor mention any plant by the name of *Butonica sylvestris*; nor does Rheede notice the *Butonica terrestris rubra.* M. Lamarck saw specimens of his plant; and from the account which he gives of the calyx, it was evidently the *Samstravadi* of Rheede. Willdenow, on the contrary, says nothing to enable us to judge whether his specimens belonged to the *Samstravadi* or to the *Butonica terrestris alba.*

Jussieu was the first, as far as I know, to point out a tolerably correct arrangement of the *Samstravadi,* by separating it from the *Eugenia* and placing it (*Gen. Plant.* 361.) in the same genus with the *Butonica* of Rumphius and Lamarck, the *Barringtonia* of Forster and the younger Linnæus, and the *Commersonia* of Sonnerat, which the elder Linnæus had placed among the *Guttiferæ* in the genus *Mammea.* Perhaps M. Jussieu should have taken the genus of Rumphius as it stood, and included in it not only his three *Butonicas,* but the two *Samstravadis* of Rheede; but Jussieu considered the *Tsjeria Samstravadi* and the *Butonicæ terrestres* as forming a distinct genus from the *Butonica,* and called this genus *Stravadium* (*Gen. Plant.* 361.).

Dr. Roxburgh however (*Hort. Beng.* 58.), as I have above proposed, includes in the same genus both the *Butonicas* of Rumphius and the *Samstravadis* of Rheede, calling the plant, of which I am now treating, *Barringtonia racemosa*; but he does not quote Rheede, deterred probably by the following words in the description, "Arbor est vastæ magnitudinis caudice crasso," while, I must confess, that the plant which Dr. Roxburgh and I knew, is only a small tree; but I cannot on this account call it a different species.

When I returned from Ava, I sent to England both specimens and a drawing of the *Samstravadi,* which were given to Sir Joseph Banks. A copy of the drawing has been lodged in the Library of the India House, where I have also placed specimens from India Proper. In deference to M. Jussieu I have classed it in the Catalogue with his second division of the order of *Myrti*; but I suspect that it might with more propriety be arranged with the second division of

the *Guaiacanæ,* as will appear from the following description. The natives of Ava call it *Kiin gri,* the first word being the generic term, and *gri* signifying *great.*

Arbuscula pulchra. *Folia* sparsa, apices versus ramulorum congesta, basi obtusa obovata, acuta, ultra pedem longa, costata, venis reticulata, nuda, serrata, petiolata.

Racemi longissimi, penduli. *Flores* ex albido rubicundi, magni, speciosi, calycibus coloratis, striatis.

Calyx foliolis concavis obtusis 2- seu 3-partitus, persistens, intus disco integro mellifero ad basin vestitus. *Petala* 4 seu 5 patentia, obtusa, concava, obliqua. *Filamenta* plurima filiformia, petalis longiora, basi coalita in annulum discum calycis cingens. *Antheræ* parvæ. *Germen* inferum turbinatum. *Stylus* longitudine staminum filiformis. *Stigma* simplex.

Bacca molliuscula, tetragono-ovata, calyce coronata, obsolete quadrisulca, unilocularis. *Semen* unicum, oblongum, magnum. *Perispermum* forma seminis magnum. *Embryo* centralis, ovalis, dum non germinaverit absque partium distinctione indivisus.

Tsjeria seu Sjeria Samstravadi, *p.* 15. *tab.* 7.

In the preceding commentary I have already made several remarks applicable to this plant, which the Brahmans call *Gove-sada-pali,* using the last two words as a compound generic name, and the words, therefore, should have been printed *Gove Sada-pali.*

Notwithstanding the utmost affinity between this and the preceding, Commeline could trace scarcely any resemblance to the *Eugenia,* in which, not having been misled by the native nomenclature, he judged properly. Ray, however, more consistently with his admitting the *Samstravadi* to be an *Eugenia* or *Jambos,* allowed the *Tsjeria Samstravadi* to belong to this genus: but Plukenet more cautiously called it *Nuci pomifera Arbor Orientalis Castaneæ equinæ foliis, fructu longo corticoso crasso, tetragono, summo apice* (*Pomi in modum*) *umbilicato, nucleum nudum angulosum includente* (*Alm.* 266.), in which he entirely overlooked the leaves of this being simple, and those of the Horse Chestnut being compounded.

Although neither Rumphius, nor his editor Burman, considered either species of *Butonica terrestris* as the same with the *Tsjeria Samstravadi*; and although Linnæus in the *Flora Zeylanica* (190.) quoted the latter alone, with the synonyma of Ray and Plukenet, for his *Eugenia foliis coronatis, pedunculis terminantibus, pomis oblongis acutangulis*; yet in the *Species Plantarum,* copied by the younger Burman (*Fl. Ind.* 114.), he introduced, as synonymous with the *Tsjeria Samstravadi,* the *Butonica terrestris rubra,* adding to *Eugenia* the specific name *acutangula.* This arrangement was of course followed by Willdenow (*Sp. Pl.* ii. 996.). M. Lamarck, however, observing, I presume, that the fruit of the *Butonica terrestris rubra,* as represented by Rumphius (*Herb. Amb.* iii. *t.* 115.), has no great resemblance to that of the *Tsjeria Samstravadi,* being too much attenuated at the ends, rejected this quotation, and considered the *Butonica terrestris alba* (*Herb. Amb.* iii. *t.* 116.) as the *Tsjeria Samstravadi,* the form of the fruit in the figures of these plants, by Rheede and Rumphius, having a great resemblance. I must, however, observe, that Rheede says of the *Tsjeria Samstravadi,* "Flores purpurei;" and he represents the flowers as disposed in racemes; while of the *Butonica terrestris alba* Rumphius says, "petiolis (pedunculis communibus) insident capitula viridia sese in bina ternave crassa petala (calycis lacinias) aperientia, in quorum centro quatuor alia alba et extensa conspiciuntur petala, restans floris pars in medio repleta est albis staminibus ad basin rubescentibus, antheras fuscas gerentibus." Further, he not only represents the flowers and fruit as disposed in spikes, but says, "pomula sessilia, quum priora (id est, fructus *Butonicæ terrestris rubræ*) ex pedunculo (pedicello) dependeant." We may safely, I think therefore, infer that, notwithstanding the similarity of the fruits, the *Tsjeria Samstravadi* and *Butonica terrestris alba* are not the same plant. In fact, neither species of the *Butonica terrestris* seems to have been described by Rheede, nor either species of *Samstravadi* to have been described by Rumphius; as we may infer not only from the circumstances above mentioned, but also from the form of the leaves as represented by the two authors.

The variations of opinion on the subject, among the best botanists, seem to have deterred Dr. Roxburgh from quoting either author for his *Barringtonia acutangula* (*Hort. Beng.* 52.), although I have no doubt that it is the *Tsjeria Samstravadi.* From Ava, where it is called *Kiin ngæh* (little), I sent speci-

mens to Sir Joseph Banks under the name adopted by Dr. Roxburgh; and I have since given specimens to the library at the India House under Jussieu's name of *Stravadium acutangulum*; for, although I cannot approve of so violent a corruption, I must yield to his superior authority. In the dialects spoken in Gangetic India, where it is one of the most common trees, it is called *Ijjal* or *Hijjal.*

Arbor magnitudine mediocris. *Rami* petiolorum cicatricibus exasperati. *Folia* sparsa, ramulorum apices versus approximata, obovata, apice nunc obtusa tunc acuta, basi cuneata, nitida, nuda, costata, venis reticulata, utrinque viridia. *Petiolus* brevissimus, supra planus, glaber, non stipulaceus.

Racemus terminalis, simplicissimus, pendulus, foliis longior, nudus, glaber. *Flores* sparsi, parvi, filamentis coccineis rubentes.

Calyx superus, laciniis erectis obtusis æqualibus 4- seu 5-partitus. *Petala* sæpius quatuor revoluta, oblonga, basi cohærentia, ad staminum columnam adnata. *Filamenta* plurima, longissima, filiformia, basi coalita. *Antheræ* parvæ, subrotundæ. *Germen* inferum, tetragonum. *Stylus* longitudine et figura staminum simplex. *Stigma* indivisum.

Bacca sicca, oblonga, tetragona, calyce coronata. *Semen* unicum, maximum, oblongum, circinatum.

I have not noticed the structure of the seed, as the description was taken in Ava, before I had seen the work of Gærtner.

Malla Katou Tsjambou, seu M. Catu Tsjambu, *p.* 17. *tab.* 8.

Commeline joins the vulgar, Hindus, Portuguese and Dutch, in considering this as a *Jambu*, or *Eugenia*, very nearly allied to the plants now called *E. Jambos* and *E. malaccensis*; while the Brahmans seem to err as much in calling it *Mal Ambetti* (*montana Mangifera fœmina*). It must be admitted that the figure represents the plant less like the *Eugenia* than it ought, because the leaves have been drawn as if alternate; but from the description we learn that this is erroneous ("Folia geminata brevibus petiolis decussato ramulis inhærent"). So far, therefore, as to its leaves, it might be an *Eugenia*; but then the flower is divided into five or six parts, the latter seeming to be the natural number, as the style is divided into three; and besides, some

individuals would appear to be entirely female, as that described by Rheede, who does not mention any stamina. Both circumstances are incompatible with its being an *Eugenia.*

Plukenet was as unfortunate as Commeline in comparing this plant to his *Arbor Indica Pyri densioribus et subrotundis foliis, fructu Nucis Moschatæ magnitudine summo vertice coronato* (*Mant.* 23. *pl.* 3. *t.* 336.), which is pretty evidently a *Gardenia,* and quite different from the *Malla Katou Tsjambou.*

The elder Burman, in his observations on Rumphius (*Herb. Amb.* i. 128.), thinks that this is the *Jambosa silvestris alba,* which again he considers as a variety, or rather as the female plant, of the *Malacca Schambu,* that is, of the *Eugenia Jambos.* In both opinions he is probably wrong; for the *E. Jambos* has no flowers merely female, nor is the *Jambosa silvestris alba* the same with the *Malacca Schambu,* as I have endeavoured to show (*Linn. Trans.* xiii. 482.). It is, however, very possible that the *Malla Katou Tsjambou,* as the same Burman in another place alleges (*Thes. Zeyl.* 125), may be his *Iambos sylvestris et montana fructu Cerasi magnitudine,* which is the *Maharatambola* of the Ceylonese; but it cannot be the *Jambosa silvestris parvifolia* of Rumphius (*Herb. Amb.* i. 129.; ii. *t.* 40.), with which Burman there joins it, because that is a real *Eugenia* with hermaphrodite flowers; and the *Malla Katou Tsjambou,* or *Maharatambola,* on account of its diœcious flowers, terminal panicles, and trifid style, notwithstanding the authority of Linnæus (*Fl. Zeyl.* 501.), I cannot consider as belonging to this genus. It seems, indeed, to have a greater resemblance to the genus *Scopolia* of Forster, as described in the *Encyclopédie Méthodique* (vii. 14.; *Ill. Gen. t.* 860.).

Katou Tsjeroe, seu Cattu Tsjeru, seu C. Cheru, *p.* 19. *tab.* 9.

Katou and *Rana,* the specific names used by the vulgar and learned of Malabar, have the same meaning, that is, signify anything wild or uncultivated; while a species that is planted round the corn-fields, and described in page 20, is considered the prototype of the genus called *Tsjeroe* or *Cheru* by the vulgar, and *Bibo* by the learned. It seems to be from a very considerable affinity between this tree and the *Anacardium occidentale* that the natives of India, according to Clusius (*Enc. Méth. Suppl.* i. 753.), gave to the latter the name of *Bybo,* evidently the same with *Bibo,* used by the Brahmans of Malabar.

Commeline, however, does not venture to compare this with any plant then known; and it was with uncertainty that Plukenet quoted it for his *Prunifera arbor* seu *Nuciprunifera folio dodrantali longitudine, lævi mollitie prædito* (*Alm.* 306.; *Phyt. t.* 218. *f.* 1.), a West Indian plant that I cannot trace in modern authors, unless it be the *Achras Sapota*, which, according to the *Hortus Kewensis* (ii. 312.), is called the *Bully-tree*, if that be the same with the *Bully-Bay* used in Barbadoes according to Plukenet. Should this be the case, the West Indian plant can have no affinity with the *Tsjeroe*.

M. Lamarck thought that the *Tsjeroe* might be a *Mangifera*, and it is accordingly mentioned (*Enc. Méth. Suppl.* iii. 584.) under the name of *Mangifera? racemosa*, M. Poiret justly doubting of its being a real *Mangifera*. This is the only notice, so far as I know, that was taken of this tree by modern botanists, until I visited Chatigang in 1797, and Mysore in 1800. On my return from the former, I gave young plants to Dr. Roxburgh; and on my return from the latter, I showed him a drawing and specimens, which were afterwards given to Sir J. E. Smith, under the name of *Holigarna Vernix*; but Dr. Roxburgh called it *Holigarna longifolia* (*Hort. Beng.* 22.). The plant, which I saw, seems to be that which Rheede calls *Tsjeroe*, or *Bibo*, without prefixing a specific name, and differs from the *Cattu Tsjeru*, or *Rana Bibo*, of which he gives a figure, in having much shorter racemes, and these not at the end of the branches, but from their sides, and also in a singular small tooth-like process on each side of the *petiolus*. Dr. Roxburgh describes another species from Silhet, of which I have given specimens to the library at the India House. This genus, remarkable for the caustic nature of its juice, which is used as a varnish, I cannot reduce to any of Jussieu's natural orders. It comes nearer the *Rhus* than to any Linnæan genus; but has the germen inferum; on this account, as well as its caustic juice, it seems nearly allied to the *Rak* of Japan (*Kœmpf. Amœn. Exot.* 793.), and to the *Arbor Vernicis* of Rumphius (*Herb. Amb.* ii. 259. *t.* 86.), which M. Lamarck (*Enc. Méth.* i. 350.) calls *Terminalia Vernix*. I should, indeed, have no doubt of their belonging to the same genus, did not Rumphius say, "flores plurimis staminibus rubris referti," which, if accurate, would show an essential difference between his plant and both the *Bibo* and *Terminalia*. In fact, the two latter have no sort of affinity, while the number of styles and the position of the germen distinguish the *Bibo* most

clearly from the *Mangifera*. I shall now give the description, which I took in Mysore.

HOLIGARNA LONGIFOLIA. *Hort. Beng*. 22.
Tsjiero seu Bibo. *Hort. Malab*. iv. 20.
Cheru Taulavæ.
Biba Concanæ. *Buchanan's Mysore*, iii. 186.
Holigarna Carnatæ.
Habitat in Indiæ sylvis montosis, humidis.

Arbor verniciflua, succo caustico, venenato, recente albo seu hyalino, exsiccato nigricante scutens. *Rami* cicatricibus obovatis exasperati. *Folia* alterna, apices versus ramulorum conferta, oblonga, cuneata, acuminata, margine revoluto integerrima, costata, venis reticulata, glabra, junioribus tamen subtus pubescentibus. *Petiolus* semiteres, brevissimus, denticulo subulato patente utrinque apicem versus instructus, non stipulaceus.

Racemi infrafoliacei, sparsi, simplicissimi, adscendentes, folio breviores, undique pilis ferrugineis tecti. *Flores* diœci, pedicellati, parvi, sparsi, vel aliquando fasciculati, albi. *Squamæ* in racemo et pedicellis vagæ.

Masculini floris calyx minimus, quinquelobus. *Petala* quinque, ungue lato fere coalita, intus barbata, calyci inserta. *Filamenta* quinque petalis alterna et longiora, patentia. *Antheræ* cordatæ.

Fœminei floris calyx brevissimus, cyathiformis, fundo setosus, ore obsolete quinquangularis. *Petala* quinque, linearia, intus villosa, ungue lato subcoalita, calyci inserta. *Filamenta* quinque, subulata, brevissima, perigyna, petalis alterna. *Antheræ* simplices, nescio an fertiles? *Germen* magnum, inferum, compressum. *Styli* tres, erecti. *Stigmata* crassa.

Drupa compressa, monosperma.

TANI, *p*. 23. *tab*. 10.

In the Hindwi dialect I cannot trace the name *Gottinga*, said to be used by the Brahmans of Malabar for this tree. According to Rheede, the vulgar inhabitants of Malabar reckon this the prototype of the genus *Tani*, which, however, is very unnatural, as this species has no affinity to the following plant, which is also called *Tani*, with a specific name prefixed. As I under-

stood the natives of Malabar, it is the fruit which is called *Tani*; for they called the tree *Tani Cai Maram* (*Tani fructus arbor*), Buchanan's Mysore, ii. 342.

The plant of C. Bauhin (*Fructus in insula S. Mariæ, pyra majora referens intus muculentum*), with which Commeline compares this, can scarcely be the same, on account of the size and mucilaginous quality of its fruit, and is probably rather a *Mabolo* or *Diospyros* than a *Myrobalanus*, although Plukenet rather thinks it a *Syalita* (*Dillenia*), which, however, he confounds with the (*Artocarpus*) Bread fruit (*Mant.* 124.). In his Index he mentions the *Tani*, but without a reference to the part of his work where it is to be found, nor have I been able to discover the place.

Commeline afterwards called the *Tani* a *Prunus*, in which gross error he was followed by Ray and the elder Burman (*Thes. Zeyl.* 197.); the latter, indeed, was still further in the wrong, because he confounded it with the *Dematha* of the Ceylonese, which is the *Gmelina asiatica*, as Linnæus, in rejecting Burman's synonyma, rightly observes (*Fl. Zeyl.* 230.).

Gærtner considered the *Tani* as the same with his *Myrobalanus Bellirica* (*De Sem.* ii. 90. *t.* 97. *ubi errore Bellirina dicitur*), and certainly the fruits of the two plants are extremely similar; but the form of the seed and loculamentum is different, in that of Rheede being circular, and in that of Gærtner being angular. Whether or not the latter was right, in considering his plant as the *Myrobalanus Bellirica* of Blackwell and Breynius, I cannot say, not having it in my power to consult these authors; but he says that Blackwell's figure is bad, or, in other words, does not entirely resemble his plant. M. Poiret (*Enc. Méth.* vii. 576.) seems doubtful whether Gærtner was right in quoting the *Tani* for his *Myrobalanus Bellirica*, and in the Supplement (iii. 707.) to the *Encyclopédie* states this doubt more fully. Dr. Roxburgh does not quote (*Hort. Beng.* 33.) the *Tani* for the *Terminalia Bellirica*, which is a name not mentioned by Willdenow, although I suspect that Dr. Roxburgh's plant is what Willdenow calls *T. Chebula*, because he says, "foliis obovato-oblongis," while the *Chebula* of Dr. Roxburgh, the same with that of Retzius, has folia ovata. The *Tani* has folia obovata, and may therefore be the *T. Chebula* of Willdenow. In this case the *Tani* cannot be either the *M. Chebula* or *M. Bellirica* of Gærtner; the former on account of the difference in the form of their

fruits, and the latter for the reasons I have already stated: and besides, the flowers of the *T. Bellirica* of Retzius, which in the Hindwi dialect is called *Bahara*, have an abominable stercoraceous smell, while Rheede says of his plant " flores suaveolentes."

In the woods of Southern India (*Buchanan's Mysore*, i. 183.) I found a tree called *Tari* in the dialect of Carnata, and *Tani Cai Maram* by those of Malabar, as already stated, which therefore, I have little or no doubt, is the *Tani* of Rheede, although I have not noted the smell of its flowers, by which chiefly it is distinguished from the *Terminalia Bellirica*. Specimens were given to Sir J. E. Smith under the name of *Terminalia* or *Myrobalanus Taria*, and I shall here annex a description.

Arbor magna, ligno firmo, albido, non resinoso, durabili. *Ramuli* sulco e petiolo utrinque decurrente angulati, surculis novis pubescentibus nudi. *Folia* decidua, subopposita, apices versus ramulorum conferta, obovata, aliquando acuta, sæpius cum acumine obsoleto obtusa, margine cartilagineo integerrima, costata, venosissima, coriacea, eglandulosa; juniora pubescentia, adulta utrinque glabra. *Petiolus* compressiusculus, marginatus, glaber, supra medium glandula, ætate sæpe evanida, utrinque instructus, brevis, non stipulaceus.

Spicæ infrafoliaceæ vel axillares, petiolo longiores, pubescentes, laxæ, nudæ, solitariæ. *Flores* sparsi: superiores masculini; inferiores in eadem spica hermaphroditi.

Drupa subcarnosa, angulis quinque obsoletis obovata. *Nux semine* esculento monosperma.

In the collection of specimens which I have given to the library at the India House, are those of several varieties of the *Terminalia Bellirica*, which, as I have said, I can scarcely distinguish from the *Tani* by any mark, except the smell of the flowers; for I found a very considerable difference in the form and pubescence of the leaves, in the shape of the nut and seed, and in the presence or absence of glands, in the different trees that were admitted by all to be the *Bahara*, the name by which the plant with fetid flowers is known in the Hindwi dialect. In some places the *Bahara* was distinguished into two kinds, the great and the small, on account of a difference in the size of the fruit. The

flowers of that with the small fruit are not so offensive as those of that with the large drupe, and therefore, in this respect, it approaches to the *Tani*; but then the fruit of the *Tani* is as large as that of the *Great Bahara*, or as Gærtner's *Badamia*, while the fruit of the *Small Bahara* is like that which, by an error of the engraver, is called *Bellirina* in the 97th table of Gærtner. On the whole, these plants require still further examination. I shall, however, describe the fruit of the large and small kinds of *Bahara*, the first taken at Domdoho, and the latter at Duriapur, both differing somewhat from the figure given by Gærtner; but I think, as I have said, that these fruits are subject to very considerable variations in the same individual tree.

Bahara major.

Drupa Juglandis integræ magnitudine obovata, sessilis, umbilicata, junior pubescens, carnosa, obsolete pentagona, subæquilatera. *Caro* crassa, succo flavo scatens. *Nux* crassa, dura, circinata, cavitate quoque circinata. *Semen* forma cavitatis. *Integumentum* crassum, membranaceum. *Perispermum* nullum. *Cotyledones* crassæ, conduplicatæ, una alteram amplectante, ut in gemma obvoluta, et minime circumactæ ut in *Terminalium* pluribus.

Baharæ majoris fructus.

Sectio horizontalis.

primum.

Baharæ minoris semen.

alterum.

Bahara minor.

Drupa magnitudine nucis *Moschatæ* obovata, obsolete pentagona, subæqualis, carnosa, umbilicata. *Caro* crassa, succo, aqueo scatens. *Nux* crassa, dura, circinata, cavitate obsolete trigona, sed minime lobata ut in Gærtneri figura. *Semen* forma cavitatis. *Perispermum* nullum. *Cotyledones* crassæ, conduplicatæ; in uno fructu una alteram fovente; in altero, ut in Gærtneri fere figura, se invicem intercipientibus.

Tsjem Tani, *p.* 25. *tab.* 11.

The vulgar in Malabar, by a very rude attempt at classification, place this in the same genus with the preceding *Terminalia*; while the Brahmans err no less in calling it a *Morij,* that is, a *Pepper,* for which there seems no other ground but its having some aromatic quality. Commeline makes no attempt at classification, a prudence which Ray might as well have adopted, instead of calling it *Myxa pyriformis ossiculo trispermo,* by which absurdity he induced Plukenet to compare it with the *Prunus Sebestenæ similis Americana* of Herman (*Alm.* 306.), by no means an improvement.

Linnæus, in the first edition of the *Species Plantarum,* followed by Burman (*Fl. Ind.* 16.) and by Willdenow (*Sp. Pl.* i. 187.), rightly considered it as a distinct genus, which he called *Rumphia,* and gave this the specific name *amboinensis.* This, however, was doing little more than freeing us from the error of Ray, for its affinities are not mentioned, and some difficulties attend the giving it a place, as Jussieu refers it with hesitation to his *Terebinthaceæ,* and doubts if it is not more nearly allied to the *Sapindi.* M. Poiret seems to adopt the former opinion without doubt (*Enc. Méth. Suppl.* vi. 352.). The specific name given by Linnæus was probably with a view to express the connexion of Rumphius with *Amboyna*; but as it might also imply that the tree was a production of this country, where it has not yet been discovered, M. Lamarck changed the name into *tiliæfolia* (*Tabl. Enc.* 96.; *Ill. Gen. t.* 25.), which has been followed by M. Poiret (*Enc. Méth.* vi. 352.).

Mal Naregam, seu Nara maram, seu Catu Tsjeru Naregam, *p.* 27. *tab.* 12.

Naregam, a generic term used for a good many plants, seems to be the same with *Narenggi,* used occasionally in the Gangetic dialects for plants of the genus called *Citrus* by botanists; although *Limbo,* evidently the same with the *Nimba* of the Brahmans of Malabar, is more common. All these terms, however, are applied to several plants having very little affinity to the *Citrus,* as is the case here. *Mal,* the specific name used in the text, signifies mountain; and *Rana,* employed by the Brahmans, signifies wild. The Dutch, therefore, rightly interpret the native name into *Wilde Citroenen.* Concerning the terms *Nara* and *Nani* I can give no explanation, only that they seem both

generic; but the specific name given on the plate consists of two words, *Catu*, implying forest (*sylvestris*), and *Tsjeru*, implying that the plant has an affinity with the *Tsjeru* delineated in the 9th plate. These names in the plate, however, seem to have been applied by mistake, as they are not mentioned in the text, and are given, only in a reversed order, to the plant delineated in plate 14, which has led to several mistakes, as will be soon mentioned.

None of the comparisons above mentioned are fortunate; yet they seem to have satisfied Herman and Commeline, who called the plant *Malus Limonia pumila sylvestris zeylanica.* Plukenet was, however, inclined to class it with a genus called by old botanists *Coru*; and thought that it might be the same with his *Coru Indorum Mali aureæ foliis, floribus albis; Parencoruttee Malabarorum* (*Mant.* 57.), justly observing, that it had more affinity to the *Prunus* than to the *Malus*, with which *Citrus* was then classed.

The elder Burman quotes this plant for his *Limonia Malus, sylvestris, Zeylanica, fructu pumilo*; but as he also quotes the *Limonellus* of Rumphius (*Herb. Amb.* ii. 107. *t.* 29.), and the *Malus Aurantia, fructu Limonis pusillo, acidissimo* of Sloane, there can be little doubt that he meant the species of *Citrus*, commonly called *Lime* by the English, which has no resemblance to the *Mal Naregam.* The latter, however, has a strong resemblance to Herman's *Limones pumili, Zeylanici, sylvestres, Dehighaha zeylonensis,* (*Thes. Zeyl.* 143. *t.* 65. *f.* 1.), which Linnæus left among the *plantæ barbaræ annihilatæ* (*Fl. Zeyl.* 606.).

The younger Burman quotes the *Catu Tsjieru Naregam* and his father's *Limonia Malus, sylvestris, Zeylanica, fructu pumilo,* for his *Limonia acidissima*; but then, as the plant he meant had pinnated leaves, he quotes the 14th plate of Rheede, which delineates the *Tsjeru Catu Naregam,* and cannot have the smallest resemblance to the plant meant by the elder Burman. To this error he seems to have been led by Linnæus, who for his *Schinus foliis pinnatis, rachi membranaceo-articulato, spicis axillaribus solitariis* (*Fl. Zeyl.* 175.). afterwards called *Limonia acidissima,* quotes the *Tsjerou Katou Naregam,* Rheed. *Mal.* 4. *t.* 12., instead of the *Tsjeru Catu Naregam, t.* 14., and joins this to the *Limonia Malus, sylvestris, Zeylanica, fructu pumilo,* of the elder Burman, which is the *Walhedi* or *Jakuawa* of the Ceylonese, while the plant meant by Linnæus is the *Diwul* or *Giwul* of these people (*Thes. Zeyl.* 89.), a name most absurdly derived by Linnæus from the Swedish *diæwul* (devil), because, forsooth, this

fruit, to use the vulgar nautical phrase, gives our seamen trading to India a *devilish flux*! How he fell into such a mistake I cannot say, as he might have read in Burman, "Diwul notat adstrictionem gutturis quæ sæpe causatur a fructibus immaturis. Hujus autem arboris fructus astringunt, unde in dysenteria valde commendatur." It was on this quality that the genus *Coru* was founded, of which the *Diwul* is probably the prototype, as likely the same with the *Bolanga* (*Thes. Zeyl.* 31.), or *Balanghas* (*Thes. Zeyl.* 84.), that is, the *Feronia Elephantum*, which no doubt is very nearly allied to the *Limonia acidissima*; but both are very different from the *Mal Naregam*, at least in their foliage and general appearance. The *Dehi-ghaha*, which by Linnæus, as I have mentioned, was left in the *Flora Zeylanica* among the *Plantæ annihilatæ*, he afterwards in the *Mantissa* called *Limonia monophylla* (*Willd. Sp. Pl.* ii. 571.), while he adopted Burman's *Limonia acidissima*, quoting, indeed, for the latter the *Catu Tsjeru Naregam*, but evidently meaning the *Tsjeru Catu Naregam*, as he quoted the 14th and not the 12th plate.

The *Catu Tsjeru Naregam* continued, therefore, really unnoticed by modern botanists, until it was joined by M. Lamarck (*Enc. Méth.* iii. 517.) with the *Dehi-ghaha* of Burman as synonymous with the *Limonia monophylla*. Its being of the same genus, however, with the *Tsjeru Catu Naregam*, the true prototype of the genus *Limonia*, is extremely doubtful; for, setting aside the difference of habit, it would seem to have its flower divided into four petals, many stamina united at the base, and a berry with one seed.

Catu seu Katou Naregam, *p.* 29. *tab.* 13.

Commeline agrees with the inhabitants of Malabar, vulgar and learned, native and foreign, in considering this as a species of *Citrus* or *Limonia*, than which I scarcely know an attempt at arrangement more rude. Plukenet seems to have made little improvement by comparing it with the *Granata Malus Zeylanica spinosa* of Herman, which he calls *Malus Punica Zeylonensium, spinosa* (*Alm.* 240.), and *Malus Granata Zeylonensis aculeata* (*Phyt. t.* 98. *f.* 6.). Whether or not the plant of Herman is the same with that of Plukenet I cannot say; but, if it is so, I doubt very much of its being the plant of Rheede, although no doubt both belong to the same natural order, that is, to the *Rubiaceæ* of Jussieu. Plukenet, indeed, quotes the *Catu Naregam* with doubt, in which

caution he is not followed by the elder Burman, who, without hesitation, not only joins the plants of Rheede, Herman and Plukenet, but unites with these the *Malum Granatum Delima* of Rumphius (*Herb. Amb.* ii. 94. *t.* 24. *f.* 1.), and the *Arbor Granata* of Grimm, which are no other than the common *Pomegranate,* and thus attributes all its virtues to the *Catu Naregam* (*Thes. Zeyl.* 111.).

These errors were too gross for subsequent botanists, among whom I have not been able to trace any notice of the *Catu Naregam.* It belongs, however, to that assemblage of plants called *Gardenia* by Linnæus, or rather by his editors, who have under this name included several very distinct genera. On account of the number of stamina, very uncommon in this natural order, the *Catu Naregam* comes nearest the *Gardenia Thunbergia* (*Willd. Sp. Pl.* i. 1226.); but it differs in being thorny, and, what is of more importance, in the structure of the fruit, that is to say, if the fruit of the *Gardenia Thunbergia* has actually four cells; but it is very possible that it may have only two, each being again divided by a process from the septum, separating the seeds in each cell into two masses enveloped by a congeries of pulp and membranes, so that the whole may readily be mistaken for four cells. But a fruit divided into two cells, each containing many seeds fixed to the septum medium by a longitudinal receptaculum, is what constitutes the real generic character of the *Randia* (*Gœrtner De Sem. t.* 26.) not well distinguished from the *Genipa* (*t.* 190.) and *Tocoyena* (*t.* 190.). If the membrane lining the outer parietes of the fruit be indurated into a ligneous substance, we have the fruit of the *Posoqueria* (*t.* 195.) or *Ceriscus* (*t.* 140.), a distinction, perhaps, too minute to separate these plants from the *Randia,* as resting merely on a greater or less degree of induration in the same organ; but the true *Gardenias* (*t.* 193, 194.) are abundantly distinct, from the want of any division in the fruit, and from the seeds being annexed to the outer parietes instead of to a septum medium. The *Catu Naregam* has perhaps, therefore, the same generic characters with the *Gardenia Thunbergia,* and ought not, perhaps, to be separated from the genus *Randia,* as I have defined it, unless the number of stamina be considered sufficient; for the *Randias* have only half the number of stamina, and among the *Rubiaceæ* this is of considerable importance; but when the habit is so similar, and the number of species moderate, such a difference deserves

little attention. I have indeed found a tree which, were it not for the number of stamina, and for its flowers wanting odour, I should have taken to be the same with the *Catu Naregam.* I shall here describe it, partly in order to show that this difference in number is not accompanied by any difference of habit that could justify a separation of genus, and partly because this may be the very plant that Plukenet and Burman took for the *Catu Naregam.* Specimens have been given to the library at the India House.

RANDIA VIROSA.

Posoqueria drupăcea. *Gærtn. De Sem.* iii. 77. *t.* 195.?

Granata Malus Zeylanica, spinosa. *Burm. Thes. Zeyl.* 111.?

Malus Punica zeylonensium spinosa. *Pluk. Alm.* 240.?

Malus Granata zeylonensis aculeata. *Pluk. Phyt. t.* 98. *f.* 6.?

Laurifolia minor ex Java. *Pluk. Mant.* 115. *ad Alm. p.* 211. *l.* 3. referens, quæ ultima tamen forte est *Garcinia Mangostana,* Horto Malabarico perperam citato.

Bis (virosa) Moyen Bengalensium.

Habitat in Indiæ Gangeticæ dumetis.

Arbuscula *Vangueriæ* facie. *Rami* rigidi, non pubescentes. *Ramuli* brevissimi, ex anni præteriti foliorum axillis (foliis deciduis nudati), subquadriphylli. *Rami* nunc inermes; tunc spinis oppositis supra ramulorum axillas enatis, rectis, ramulos longitudine æquantibus armati. *Folia* opposita, approximata, oblongo-obovata vel cuneata, acuta, integerrima, glabra, subcostata, venosa. *Petiolus* brevissimus, marginatus. *Stipulæ* petioli longitudine interfoliaceæ, ovatæ, acutæ, diaphanæ.

Pedunculi terminales 1—3, uniflori, petiolo vix longiores. *Bracteæ* vix ullæ. *Flores* mediocres, lutei, inodori.

Calyx glaber basi longitudine tubi corollæ cylindraceo; limbo quinquepartito laciniis patentibus, linearibus, acutis, corolla vix brevioribus. *Corollæ* hypocrateriformis tubus crassus, brevis, teres, ad medium intus pilis cinctus; limbus glaber, æstivatione imbricata obliquus, quinquepartitus laciniis obovatis, acutiusculis. *Antheræ* quinque ad corollæ incisuras adnatæ, oblongæ, acutæ, basi emarginatæ. *Germen* inferum, globosum, glabrum. *Stylus* longitudine tubi teres. *Stigma* exsertum, ovatum, sulcatum, bipartibile.

Pomum magnitudine fructus Juglandis subrotundum, calyce truncato umbilicatum, parietibus crassis intus in putamen tenue induratis biloculare. *Receptacula* e medio septi utrinque enata, membranacea, bifida. *Semina* plura horizontalia, bifariam in singulis pomi loculis nidulantia, pulpo carnoso tecta.

It must be observed, that the *Gardenia uliginosa* (*Hort. Beng.* 13.; *Hort. Kew.* i. 370.; *Willd. Sp. Pl.* i. 1228.) differs in no essential generic character from the preceding, and therefore I entirely approve of M. Poiret having called it *Randia uliginosa* (*Enc. Méth. Suppl.* ii. 829.), under which name I have presented specimens to the library at the India House. That the *Genipa* (*Gærtn. De Sem. t.* 190.) is to be considered as a different genus seems very doubtful. I did not examine the position of the embryo in the seeds of the *Randia uliginosa*, and therefore cannot say whether it is similar to that in the *Genipa*; but Gærtner's figure of the fruit of the latter is, on the whole, a good representation of that of the *Randia uliginosa*; and I must protest against such minute differences in structure, as Gærtner here relies on, being held as a sufficient ground for tearing asunder natural *genera*, a practice, I am sorry to say, now too common among botanists.

Tsjerou Katou Naregam, seu Tsjeru Catu Narejam, *p.* 31. *tab.* 14.

In the commentary on the *Mal Naregam* I have noticed the mistakes which have arisen from the carelessness of Rheede, or of his editors, in prefixing to the figure of that plant the specific names *Tsjeru* and *Catu*, which belong to this, with only the order reversed. The Brahmans of Malabar, as well as the vulgar, class this with the *Citrus*. With his usual want of care in the orthography of Indian words, Rheede in the plate not only spells the vulgar name differently from what he does in the text, but the name said to be given by the Brahmans in the plate is *Naringi* (*Orange*), while in the text it is *Cit Rana Nimba* (*alba, fera Citrus*). All these names, however, agree in classing it with the *Citrus*, while even Commeline condemns in some sort this arrangement, which was however adopted by Ray, who called it *Malus Limonia Indica fructu pusillo* (*Hist. Plant.* 1658.). Plukenet, who at first followed the same idea, and called it *Malus Limonia Lentisci foliis Zeylanica, fructu minimo, uvarum magnitudine æmulo* (*Alm.* 239.), afterwards (*Mant.* 125.) became sen-

sible of this error, and classed it with the *Coru*, of which, as I have said in treating of the *Mal Naregam*, the prototype is probably the *Feronia Elephantum* of modern botanists.

In commenting on the *Mal Naregam*, I have already mentioned the error into which the elder Burman fell by quoting this plant for the *Walhedi* or *Jakuawa* of the Ceylonese, which, from the synonyma of Rumphius and Sloane, seems to be rather the small-fruited *Citrus*, called *Lime* by the English. *Linnæus* seems to have been aware of this, and therefore joined the *Tsjerou Katou Naregam* with the *Diwul* or *Giwul*, although by an error, probably typographical, he quotes plate 12 in place of 14. On this subject I have in this commentary made already some remarks. The *Tsjerou Katu Naregam*, or *Diwul*, Linnæus in the *Flora Zeylanica* (175.) considered as a species of *Schinus*, thus placing it in the order of *Terebinthaceæ*; but from his synonyma we must reject those of Burman and Sloane, which belong to the small-fruited *Citrus*.

The younger Burman having become sensible that the *Tsjerou Katou Naregam* could not be a *Schinus*, the fruit of which is a drupa, formed a new genus, which he called *Limonia*, and in this he included this plant and another, since called *Triphasia*, and thus returned to the old system of placing it among the *Aurantiæ*, which shows how nearly the *Aurantiæ* and *Terebinthaceæ* are allied. The *Tsjerou Katou Naregam* may therefore be most justly considered as the real prototype of the genus *Limonia*, and is perhaps still the only species properly belonging to it, several, at least, of those since annexed by Linnæus and others having both a very different character and appearance. Burman, indeed, added as synonymous the *Anisifolium* or *Boa Balangan* of Rumphius (*Herb. Amb.* ii. 133. *t.* 43.), which, however, that excellent botanist merely says has the same habit (foliatura) with the *Tsjerou Katou Naregam*; and the elder Burman, in his explanation of the plate (43.), points out essential differences. We may infer, from Linnæus quoting the plant of Rheede alone for his plant, that it was this he meant; and as Burman's *Limonia acidissima* is the *Schinus* of Linnæus, it cannot be the *Anisifolium*, although Willdenow continues to join them (*Sp. Pl.* ii. 572.). Yet, that even he means the *Katou Naregam* alone, may be inferred from his describing the fruit "Bacca trilocularis, seminibus solitariis." The *Anisifolium* is now considered as forming a distinct genus, and is called *Feronia Elephantum* (*Enc. Méth. Suppl.* ii. 630.;

Hort. Beng. 33.), although the two plants have such a strong resemblance, that I return to the opinion of Plukenet, and doubt the propriety of separating them merely on account of some differences in their fruit; at least, if a generic character exists in both their fructifications sufficient to distinguish them from the other plants of the natural orders of *Aurantiœ* and *Terebinthaceœ*; for, except in habit, the *Murraya* comes very near them, and may not be easily distinguished by characters common to them both. Specimens of both have been presented to the library at the India House.

Kœnig somehow took the *Anisifolium* to be the true *Limonia acidissima*, and the *Tsjerou Katou Naregam* was therefore called the *Limonia crenulata*; for he had discovered that the two plants were different; and this nomenclature is followed in the *Hortus Kewensis* (iii. 43.), and even in the *Hortus Bengalensis* (32.) and *Encyclopédie* (*Suppl.* iii. 44.); but in my opinion it is impossible to admit with propriety of such an innovation.

Paenoe, seu Paenu, *p.* 33. *tab.* 15.

The Brahmans of Malabar call this tree *Doepoe*, or *Dupa*, rightly translated *Arvore Ensenza* by the Portuguese, who probably used its fine resin as incense. The resin however, as Commeline observes, is very similar to the gum Anime of America, and, in fact, is often sent to Europe as such; for, as Commeline observes, a similar resin is produced by several different trees, having probably little botanical affinity with each other, which is the case also with the resin now more commonly used as incense.

The *Paenoe* is one of the most ornamental trees in India, and in the province of Canara, where alone I have seen it, is usually planted in rows by the sides of highways, making remarkably fine avenues (*Buchanan's Mysore*, iii. 89.).

Ray, followed by Plukenet (*Alm.* 28.), was as usual very unfortunate in classing this tree, which he called *Amygdalœ affinis Indica fructu umbilicato, nucleo nudo, cortice pulvinato trifido tecto* (*Hist. Pl.* 1482.). Linnæus most justly considered it as a new genus, which he called *Vateria* (*Fl. Zeyl.* 204.), and in the *Species Plantarum*, he added the specific name *indica* (*Burm. Fl. Ind.* 122.)*.

* It is, however, probable that Linnæus mentions the same tree under a different name, *Kækvria ghaha* (*Fl. Zeyl.* 630.), which is the *Arbor Kækuria ghaha odorata ex qua fluit Gumm. Elemi* of the

Commeline, after stating the affinity of the gum-resin of the *Paenoe* to Gum *Anime*, had observed, " similis arboris meminit Reechus nomine *Copalli montana.* Ad hæc e Zeylan Insula simile adfertur gummi, quapropter et hæc arbor non male forsan eo referri potest." On no stronger grounds, probably, Retzius considered this as the tree which produces Gum *Copal*, and called it *Elæocarpus copalliferus*, in which it is scarcely possible to say whether there is the greater want of care in tracing a substance used in the arts, or of skill in botanical arrangement, the *Paenoe* wanting every character by which the genus *Elæocarpus* is distinguished. Vahl, however, and Willdenow (*Sp. Pl.* ii. 1170.) adopt this name, but M. Poiret properly continues to call it *Vateria indica* (*Enc. Méth.* viii. 418.), as did Dr. Roxburgh (*Hort. Beng.* 42.). As Vahl says that his plant had all the generic characters of the *Elæocarpus* in its calyx, corolla, antheræ and fruit, we may safely conclude that it is totally different from the *Paenoe*, especially if it has a germen inferum, as Retzius is said to assert. Dr. Roxburgh alleges that the resin of the *Paenoe* is called *East India Copal*, and perhaps it may have passed for such at an Indian custom-house, where a skill in drugs is not very conspicuous; but Mr. Turnbull of Mirzapur informed me, that some he sent home for a trial would not sell for *Copal*, although it was allowed to be *Anime*. The real *Copal* and *Anime* are, however, American productions.

In 1806 I gave specimens and a drawing to Sir J. E. Smith; and I shall here give a description taken in Canara, where the tree is called *Dupada*. In Carnata it is called *Cunglium*, and in the Hindwi dialect its name is *Gugulut*.

Arbor resinifera magnitudine *Querci*. *Rami* teretes. *Turiones* farina quasi aspersi. *Folia* alterna, magna, oblonga, utrinque obtusa, vel aliquando retusa, integerrima, glabra, costata, venosa. *Petiolus* teres, medio attenuatus, rugosus, nudus, brevissimus. *Stipulæ* geminæ, laterales, caducæ, sessiles, oblongæ, integerrimæ, obtusæ, farina aspersæ, brevissimæ.

Paniculæ axillares, folio longiores, ramosissimæ, laxæ ramis alternis, teretibus,

elder Burman (*Thes. Zeyl.* 28.), who properly quotes the *Paenu* (by error printed *Paeru*), but erroneously joins it with an American tree that produces Gum Elemi, and is figured by Plukenet (*Phyt. t.* 217. *f.* 4.). It must be also observed, that the quotation from Grimm respecting the *G. Elemi* probably refers to quite another plant, the *Kækuna* of the Ceylonese, which Burman calls (*Thes. Zeyl.* 166.) *Myrobalanus Zeylanica ex qua G. Elemi, fructu odore et sapore præstans.*

albidis, farinosis. *Bracteæ* stipulæformes, caducæ, geminæ ad singulas paniculæ divisiones, et ad singulorum pedicellorum basin. *Flores* alterni, pedicellati, albi, odorati, calycibus extra farinosis.

Calyx coloratus, persistens, patulus, laciniis oblongis obtusis ultra medium quinquefidus. *Petala* quinque, longitudine calycis sessilia, disci hypogyni lateribus inserta, calyce alterna, ovata, integerrima. *Antheræ* plurimæ, sessiles, disco insidentes, seta recurva terminatæ. *Germen* superum, ovatum, sulcatum, ovulis quinque fœtum. *Stylus* subulatus, staminibus longior. *Stigma* acutum.

For a description of the fruit I may refer to Gærtner's account (*De Sem.* iii. 53. *t.* 189.), to which I have nothing to add.

It would thus appear that the *Paeroe* does not belong to even the same natural order with the *Elæocarpus*, but is nearly allied to the *Vatica*, *Shorea*, *Dipterocarpus*, *Hopea* Roxburghii, *Dryobalanops*, and *Lophira*, which form a natural order, standing between the *Gutiferæ* and *Aurantiæ*; while the *Elæocarpus*, although placed by Jussieu among the latter, is, I think, more nearly allied to the *Tiliaceæ*.

Nyalel, seu Nialel, *p.* 57. *tab.* 16.

With his too frequent want of care concerning native names, the author says that this tree by the Brahmans is called *Lassa*, which is usually applied to some species of *Cordia*; but in the plate the name given by the Brahmans is said to be *Rana Bori*, and *Rana* signifying *wilde*, the generic name is *Bori*, to which it will be found that two other plants (*t.* 40, 41.), having little affinity to this, are also referred.

Commeline compares the *Nayalel* to the *Sambucus Indica* of Bontius, an author whom I have had no opportunity of consulting. Plukenet compared both (taking them, I presume, to be the same) with his *Uvifera arbor Americana per funiculos e summis ramis ad terram usque demissis prolifera* (*Alm.* 394.; *Phyt. t.* 237. *f.* 5.); but I see no grounds for this comparison, for the leaves of Plukenet's tree are simple, and those of the *Nayalel*, like those of the *Sambucus*, are pinnated; nor does Rheede hint at its branches sending down roots like a *Ficus*, to which genus the American plant perhaps belongs.

M. Jussieu (*Gen. Plant.* 297.) and M. Poiret (*Enc. Méth. Suppl.* iv. 93.) thought that the *Nialel* perhaps belongs to the genus *Vitis*; but the habit is so different that, with all submission to such authorities, I cannot bring myself to this opinion, and rather think that it has a greater affinity to some of the *Aurantiæ*, such as the *Cookia* and *Murraya*; and especially to the *Lansium*, as I have mentioned in a Commentary on Rumphius (*Herb. Amb.* i. 151. *t.* 54.). It is remarkable that in the island of Ternate the *Lansium* is called *Lassa*, one of the names by which the Brahmans of Malabar know the *Nayalel*.

ANGOLAM, seu ALANGI, *p.* 39. *tab.* 17.

Commeline does not venture any conjecture concerning this tree, and Plukenet (*Alm.* 31.), in quoting Ray's name, "*Arbor Indica baccifera fructu umbilicato rotundo Cerasi magnitudine dicocco*," makes no advance beyond what is stated by Rheede.

M. Lamarck was the first to introduce the *Angolam* into the modern system of botany, calling it *Alangium decapetalum* (*Enc. Méth.* i. 174.). He considered it as belonging to the order of *Myrti*, and nearly allied to the *Decumaria*; but Jussieu doubts of the propriety of this arrangement, and rather thinks that it should be placed in his 4th division of the *Onagræ*, in which I entirely coincide.

Willdenow (*Sp. Pl.* ii. 1174.) and M. Poiret (*Enc. Méth. Suppl.* i. 366.) allege, copying, perhaps, from Vahl, that the younger Linnæus had previously described the *Angolam* under the name of *Grewia salvifolia*; but Linnæus did not quote the *Hortus Malabaricus*, nor does his description agree with that of the *Angolam* either by Rheede or Vahl. What authority there may be for the allegation I do not know; I suspect that it may be some specimen of the *Angolam*, marked by mistake *Grewia salvifolia*, an accident very likely to happen, and therefore by no means a good test.

IDOU MOULLI, seu IDU MULLI, *p.* 48. *tab.* 18.

Moulli, or *Mulli*, signifying Thorn, is rather the name of a class than of a genus, and the word *Idou*, or *Idu*, must therefore be either considered as generic, or the two words considered as forming a compound, like our English words Buck-thorn, Haw-thorn, Black-thorn, all signifying different genera.

The word *Elati-canto,* used by the Brahmans of Malabar, is of a similar nature, *Canto* signifying Thorn in the Hindwi dialect.

Commeline made no attempt to class this plant. Plukenet, having thought that he had a plant nearly allied to the *Wadouka* (*p.* 97.) of this volume, conceived that it might be the *Idu Mulli,* and called it *Wadouke Malabaricæ haud multum dispar, Frutex aculeatus e Maderaspatan* (*Alm.* 395.; *Phyt. t.* 69. *f.* 7.); but the figure which he gives seems to have little or no resemblance to either *Idu Mulli* or *Wadouka.* He afterwards (*Mant.* 133.) formed a more rational conjecture, and says, "*Myrobalano Bellericæ,* ut nobis videtur *Idu Mulli* congener est, et nominari potest *Myrobalanus Indica, Arbor spinis horrida, angustiore folio longo, fructu racemoso.*" Now, although from the number of stamina, as well as from the habit, this cannot be a *Myrobalanus* or *Terminalia,* I have little or no doubt of its belonging to the same natural order. At one time I thought that it might possibly belong to the genus called *Pyrularia* by Michaux (*Enc. Méth.* v. 745.), but which Willdenow has chosen, without any good reason, to call *Hamiltonia* (*Sp. Pl.* iv. 1114.). The appearance of the plants, however, differs so much, that I now think them likely to belong to different genera.

Poerinsii, seu Purinsii, seu Vercoepoelongi, *p.* 43. *tab.* 19.

The Portuguese and Dutch names arise from the saponaceous quality of the fruit; but whether or not any of the Indian names allude to this quality I know not, all the Indian names for soap that I know being derived from the Portuguese, by whom, probably, this substance was introduced; nor is it yet common, except among persons employed by Europeans.

Commeline remarks, that the natives of hot climates (*Indi*) use various saponaceous fruits; but that the *Poerinsii* was of a genus totally unknown to botanists. Ray, in arranging the plants of the *Hortus Malabaricus,* threw no further light on the subject by calling it *Prunifera fructu racemoso parvo, nucleo saponario,* although J. Bauhin had given the name *Saponaria* to some American plants nearly allied to this; but the *Nux Portoricensis amplissimis foliis venosis et læte virentibus,* with which Plukenet compares it (*Alm.* 265.; *Phyt. t.* 208. *f.* 2.), having simple leaves, can have no affinity with the *Poerinsii,* nor with the *Sphærulæ saponariæ* of J. Bauhin.

The elder Burman, on the authority of Commeline's *Flora Malabarica,* joins the *Poerinsii* with the *Saponaria arbor Zeylanica trifolia, semine Lupini* of Herman; but if Herman's specific character is not very bad, they must be different, the one having folia ternata, and the other folia pinnata; yet we can scarcely suppose Commeline to have been in such an error, and some of the leaves in the plate of Rheede no doubt are represented as ternate. If this circumstance, which is borrowed from an imperfect specimen, be admitted, and if Herman's specific character be amended, the *Conghas* of the Ceylonese may be the *Poerinsii*; but to this I shall again have occasion to revert. Burman, although with doubt, quotes also as synonymous the *Arbor prunifera, sphærulas saponarias ferens, tetraphylla, ex India Orientali* of Plukenet (*Alm.* 47.; *Phyt. t.* 14. *f.* 6.), which, as well as the *Poerinsii,* has pinnated leaves, but so different in form, that I cannot think them the same; and I shall afterwards describe a plant, which perhaps is that of Plukenet, and totally different from the *Poerinsii.* In the *Flora Zeylanica* (603.) the *Conghas* was left by Linnæus among the *Barbaræ annihilatæ,* which he could not attempt to arrange; nor does he quote for it the *Poerinsii,* deterred, probably, by observing that the leaves, when perfect, were really pinnated. When, however, he published the *Species Plantarum,* he joined the *Conghas,* that is, the *Saponaria arbor Indica trifolia* of Herman, and the *Saponaria arbor trifoliata semine Lupini* of the elder Burman, with the *Poerinsii*; and the name *Saponaria* having been given also to an herbaceous plant of the order of *Caryophylleæ,* the *Saponaria arbor* of old botanists was now called *Sapindus,* and the *Poerinsii* became *Sapindus trifoliata foliis ternatis* (*Burm. Fl. Ind.* 91.), although its leaves, when perfect, as may be seen in the figure, are pinnated. "Folia bina et bina sibi invicem opposita tenerioribus surculis (petiolis) proveniunt." At the same time, Linnæus and Burman (*Fl. Ind.* 91.) constituted another species of *Sapindus* called *Saponaria foliis impari—pinnatis, caule inermi,* for which the only authority is the *Saponaria* of Rumphius (*Herb. Amb.* ii. 134.); for the other authorities quoted, Browne, Sloane, Commeline, and Plukenet, all refer to an American plant, no doubt different from that of India, as any one may see by looking at the figure in Plukenet (*Phyt. t.* 217. *f.* 7.). Rumphius, in speaking of his *Saponaria,* says, "Similis Saponaria arbor descripta quoque occurrit in *Hort. Malab.* part. 4. fig. 19. nomine *Poerinsii.*" This does not positively assert that

Rumphius considered them as the same, but only alike. In the descriptions of the two authors, however, I can perceive no essential difference; for although in the figure of Rheede some of the leaves are represented as ternate, or even as binate, yet others are represented as pinnate; and although he says that the pinnæ are opposite, yet in the figure some are represented as alternate. It must be observed, that in order to represent all the parts, Rheede's painter has selected the extremity of a branch containing flowers, young fruit, and leaves; and in such cases, the extremity of the young flowering branches will be rarely found to have perfect leaves, especially where these are pinnated, because in this state the leaf has not arrived at full growth, and will be afterwards elongated by the extremity of the rachis communis pushing out new pinnæ. Rumphius has unfortunately given no figure; but I am inclined to think that his *Saponaria* is the same species with the *Poerinsii*, and with the *Sapindus trifoliata* of Linnæus and Burman, although it may happen that these great botanists had actually specimens of a *Sapindus* with ternate leaves, and did not entirely borrow their ideas from the figure of Rheede. If the latter was the case, the name *trifoliata* being absurd for a plant having pinnated leaves, Willdenow, copying Vahl, has done properly in calling this species *Sapindus laurifolius* (*Sp. Pl.* ii. 469.), and in rejecting altogether the *S. Saponaria* as an Indian plant, the plant so called by Burman being identically the same with the *S. laurifolius.* Of this I have given specimens to the library at the India House. It must be observed that both Willdenow and M. Poiret (*Enc. Méth.* vi. 664.), copying Vahl probably, agree in quoting the *Flora Zeylanica* (603.) for the *Sapindus trifoliata.* This erroneous name was reserved for the *Species Plantarum*, and could not be given in the *Flora Zeylanica*, where no specific names are used. The *Conghas* is mentioned in the place alluded to; and if that has really ternate leaves, it is neither the *Poerinsii* of Rheede nor the *Saponaria* of Rumphius. This can only be determined by inspecting the herbarium of Herman; but in the mean time I must observe, that Dr. Roxburgh describes the *Schleichera trijuga* as the *Kunghas* of the Ceylonese (*Hort. Beng.* 29.), and that, therefore, very likely is the 603rd plant of the *Flora Zeylanica.*

It must be still further observed, that M. Poiret (*Enc. Méth. Suppl.* iv. 447.) refers the *Poerinsii* to the *Sapindus spinosus* of Linnæus, a plant of Jamaica distinguished "caule spinosissimo" (*Willd. Sp. Pl.* ii. 469.). How this great

error came into so excellent a work I cannot say; but that it is an error there is no doubt, as Rheede neither mentions spines in his description, nor represents them in his figure.

I shall here annex a full description of the *Sapindus* above alluded to, as probably being a plant described by Plukenet (*Phyt. t.* 14. *f.* 6.). This will besides show the real structure of its fructification, so as to render evident the distinction between it and *Euphoria, Scytalia, Molinæa, Schleichera,* and other kindred plants.

Sapindus emarginatus. *Willd. Sp. Pl.* ii. 469; *Hort. Beng.* 29; *Enc. Méth.* vi. 664.

Arbor prunifera sphærulas saponarias ferens tetraphylla, ex India Orientali. *Pluk. Alm.* 47.

Ritha *Hindice.*

Habitat ad Magadhæ pagos.

Arbor mediocris ramulis teretibus, pubescentibus. *Folia* alterna, abrupte pinnata, bi- seu tri-juga. *Foliola* opposita, oblonga, utrinque obtusa, apice subretusa, integerrima, costata, venis minute reticulata, supra pilis brevissimis raris, subtus densis longis pubescentia; inferiora breviora. *Rachis* teres. *Petiolus* communis brevissimus, pubescens, basi incrassato teres: partiales brevissimi, rachi crassiores. *Stipulæ* nullæ.

Panicula terminalis, erecta, foliis brevior, conferta, ovata, constans e racemis pluribus multifloris, sparsis. *Pedicelli* sparsi, uniflori, ad medium squamula una vel altera bracteati. *Flores* albidi, parvi.

Calyx pubescens, ultra medium quinquefidus laciniis obtusis, concavis, inæqualibus, fundo tectus disco hypogyno, quinquecrenato, plano. *Petala* quinque, obovata, crenis disci inserta, calyce breviora, simplicia, utrinque pilis intus longioribus crinita. *Filamenta* octo, pilosa, petalis breviora. *Germen* trilobum, tomentosum. *Stylus* trisulcus. *Stigma* acutum, simplex.

Drupæ carnosæ, tres (una vel altera nonnunquam abortiva), obovatæ, tomentosæ, absque receptaculo sibi parietibus intus membranaceis coadunatæ, supra mucrone communi brevi instructæ, luteæ. *Caro* crassus, spongiosus, saponaceus, e putamine facile secedens. *Putamen* nigrum, politum, subrotundum, compressum, ad latus interius derasum, crassum, corneum,

uniloculare. *Receptaculum,* vel commune vel proprium, nullum. *Semen* putaminis lateri deraso adhærens, forma loculi solitarium. *Integumentum* simplex, membranaceum. *Embryo* spiralis. *Cotyledones* crassæ, carnosæ, involutæ. *Radicula* infera.

Varietatem in Cicata legi pedicellis multifloris, paniculis folio majoribus.

Specimens of both varieties have been given to the library at the India House.

From the preceding account it would appear that the *Sapindus* of Gærtner (*De Sem.* i. 341. *t.* 70. *f.* 3.) differs very much in the structure of the nut, which is said to have two cells. I suspect, however, that Gærtner has mistaken a process running up between the bend in the embryo for a septum, as once happened to myself in examining a species of *Cussambium.* The nut, it must be observed, in these two genera is very much alike, as is also that called *Koon* by Gærtner (*De Sem. t.* 180.), so that it would be difficult to say to which of the two genera the latter belonged; yet the *Sapindus* and *Cussambium* are not very nearly allied.

ADAMBOE, seu CADELI-POEA, seu CADELI-PUA, *p.* 45. *tab.* 20, 21.

It must be observed that there is another *Adamboe* (*Hort. Mal.* xi. *t.* 56.); but it has no sort of affinity to the plant now under examination, being a species of *Convolvulus.*

It is to be regretted that modern botanists did not retain the fine name *Banava* bestowed on this plant by Camelli, and consider it as a new genus. Commeline classed it and the following plant with the *Pariti,* that is, the *Gossypium*; and Breynius, Ray and Plukenet considered it as an *Alcea,* which the two latter called *A. Indica arborea, pericarpio carnoso, in plura loculamenta partito* (*Alm.* 16.), a conjecture as unsatisfactory as that of Commeline. Herman improved nothing on his predecessors by calling it an *Althæa*; nor was the elder Burman more fortunate in calling it *Ketmia Indica, foliis laurinis, flore violaceo, spicato* (*Thes. Zeyl.* 137.). Linnæus in the *Flora Zeylanica* (533.) did not venture to refer it to any known genus, but placed it, as the others had done, among the *Malvaceæ,* by the Ceylonese name *Mustu-ghas.*

In the *Mantissa* Linnæus described a tree which he called *Munchhausia speciosa*; and M. Lamarck (*Enc. Méth.* i. 39.), deriving his information en-

tirely from Rheede, and still adhering to the supposition of its belonging to the *Malvaceæ*, described the *Adamboe* by the name of *Adambea glabra*. He afterwards (*Enc. Méth.* iii. 357.) was satisfied that the *Adambea* was in fact the *Munchhausia speciosa* of Linnæus, but belonged to the same genus with the *Lagerstrœmia indica*, as Jussieu had hinted (*Gen. Plant.* 367.). He therefore called it *Lagerstrœmia Munchhausia* (*Enc. Méth.* iii. 375.), which had, he alleged, been described by Retzius under the name of *Lagerstrœmia major*. He now thought that this genus was more nearly allied to the *Salicariæ*, where it still remains in the system of Jussieu (*Gen. Plant.* 367.), although I suspect that it has a greater affinity to the *Myrteæ*, especially to *Sonneratia*.

Willdenow (*Sp. Pl.* ii. 1179.), although he admits that the *Munchhausia* and *Lagerstrœmia* belong to the same genus, does not admit the *Adamboe* to be the *M. speciosa*, but alleges it to be the *Lagerstrœmia Reginæ* of Roxburgh, or the *Flos Reginæ* of Rumphius, or the *Jarul* of the Bengalese, a plant with which I am perfectly acquainted: the *Jarul*, however, is a large forest-tree, while the *Adamboe* is but a bush, "septem circiter pedes alta;" nor did Dr. Roxburgh quote it for his plant (*Hort. Beng.* 38.). I am therefore persuaded, that from the *L. Reginæ* of Willdenow we must remove the synonyma of Lamarck, Ray and Rheede to the *L. Munchhausia*, as M. Lamarck has done.

It must be observed, that in the eastern parts of Bengal, and in Ava, where alone I have seen it growing spontaneously, the *L. Reginæ* has frequently on its trunk and larger branches a few strong straight spines, from one to three inches long. These seem to arise chiefly in old trees, growing in a favourable soil, and are considered by the natives as indicating a much finer timber than that produced by trees on which there are no spines. On this account the Bengalese add the specific name *kanta*, or 'thorny'; but I do not think that these thorns constitute a difference of species in the sense adopted by botanists. I have given specimens of this to the library at the India House.

I have also given to the same collection specimens of a tree from the same country, which Dr. Roxburgh called *Lagerstrœmia grandiflora* (*Hort. Beng.* 38.), but which I consider as belonging to a distinct genus, connecting in the strongest manner the *Lagerstrœmias* with the *Sonneratias*. In 1798 I sent specimens of this to Sir Joseph Banks under the name of *Duabanga*, to which I now add the specific name *Sonneratioides*. In Tripura it is called *Duya-*

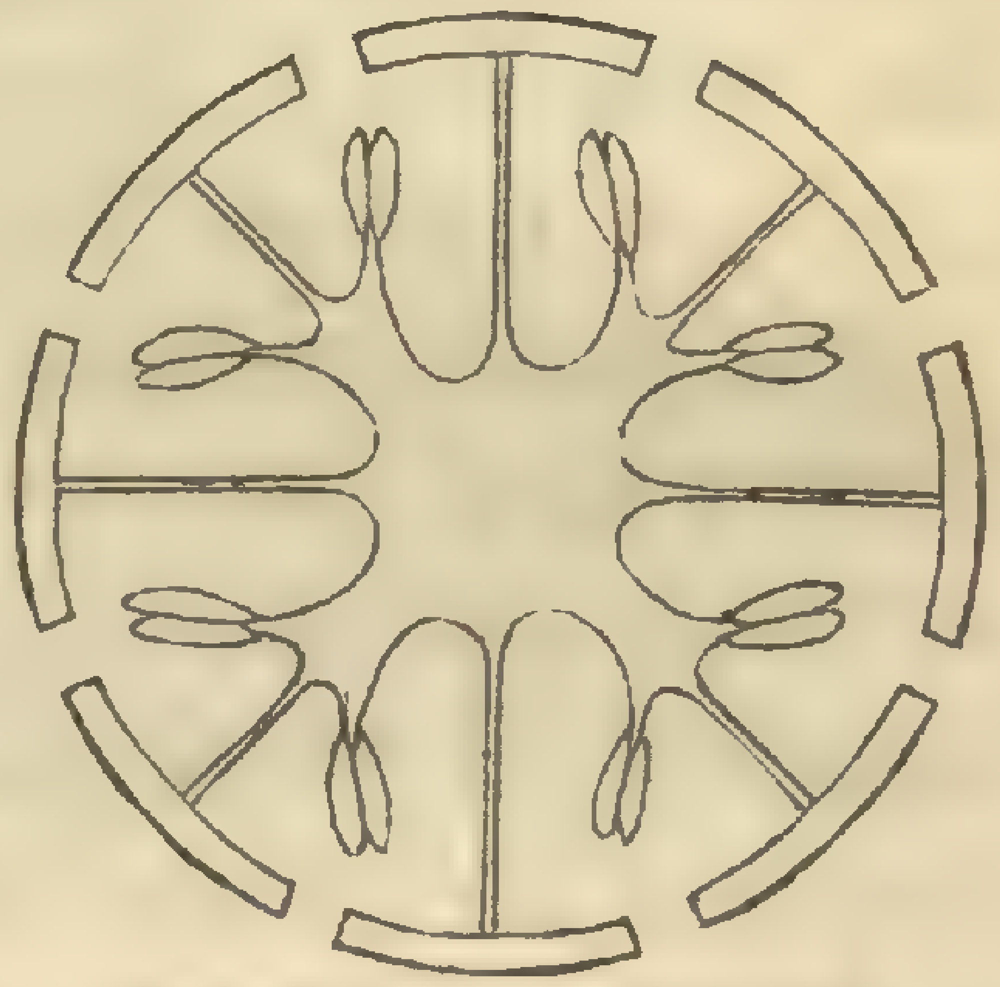
bangga, or *Banurhola*; in Camrupa it is called *Chokrosal,* and I shall here describe it.

Arbor magna. *Rami* verticillati, horizontales. *Ramuli* læves, glabri, tetragoni, petiolos communes mentientes. *Folia* opposita, horizontalia, disticha, oblonga, basi cordata, integerrima, acuminata, supra nitida, subtus nuda, costis subtus carinatis lineata, venosa, plana, pollices undecem longa, quatuor lata. *Petiolus* vix ullus. *Stipulæ* nullæ.

Paniculæ axillares et terminales, foliis breviores, ramis oppositis, angulatis, glabris, rigidis, apice pedunculiferis paucifloræ. *Pedunculi* proprii teretes, flore breviores, ebracteati. *Flores* magni, albi.

Calyx crassissimus, persistens, inferus, campanulatus, laciniis incurvis ovatis acutis ultra medium sexfidus. *Petala* sex, subrotunda, tenuissima, caduca, calyci ad incisuras inserta. *Filamenta* plura, subulata, perigyna. *Antheræ* oblongæ, incumbentes. *Germen* conicum, angulatum. *Stylus* compressus, erectus, calyce triplo longior. *Stigma* peltatum, margine lobato convexum.

Capsula subrotunda, calyci patenti insidens, magnitudine fructus juglandis, suboctovalvis, septis ad medium non pertingentibus suboctolocularis, centro concava. *Septa* e medio valvularum enata, alternis longioribus membranacea, binis lamellis conflata; *lamellæ* ad marginem interiorem loculos versus replicatæ, et in receptacula carnosiuscula incrassatæ. *Receptacula* unius septi cum iis adjacentium connata, loculos introrsum claudentia. *Semina* acerosa, pedicellata, plurima, conferta receptacula undique tegunt.



Capsulæ sectio transversa.

Katou Adamboe, seu Katou Cadeli Poea, *p.* 47. *tab.* 22.

Commeline, as I have already mentioned, considered this as a species of *Pariti,* or *Gossypium,* for no very good reason, "quippe utræque sunt species *Malvæ* seu *Altheæ arboreæ*." The error of classing it with the *Malvaceæ* was, however, persisted in by several of the best botanists, and it was called by Ray *Alcæa Indica arborea, elatior, pericarpio carnoso, subaspera.* From whence

Ray derived his "pericarpium carnosum" I cannot say, unless it was from the appearance of the transverse section of the fruit in the figure of Rheede; but this merely represents an unripe fruit; the mature one is evidently a dry capsule, as may be seen from those parts of the figure that represent it dehiscent. Ray seems to have misled Plukenet, who quotes the *Katou Adamboe* for his "*Alcœæ Indicæ arboreæ genus peculiare, foliis Beidel Ossaris, Alpini, fructu intus carnoso.*" (*Alm.* 16.)

M. Lamarck at first (*Enc. Méth.* i. 39.) considered this as a distinct species, and called it *Adambea hirsuta.* In this opinion Willdenow coincided; but knowing that the *Adambea* was of the same genus with the *Lagerstrœmia,* he called this species *L. hirsuta.* M. Lamarck, indeed, afterwards (*Enc. Méth.* iii. 376.) retracted his opinion, and considered the *Katou Adamboe* as probably a mere variety of the *L. Munchhausia*; but he adds, "Nous ne pouvons l'assurer, ne le connoissant pas;" and, as I am in a similar predicament, I would willingly follow his example, was not a very great difference, besides the pubescence, pointed out by Rheede, who says, "flores præcedentis *Adamboe* (*Lagerstrœmiæ Munchhausiæ*) ut et *Paretti* (*Gossypii*) floribus quoque similes; mediam tamen floris cavitatem et umbilicum quinque tantum stamina surrecta, candida rubicundis apicibus ornata occupant."

Karin Kara, *p.* 49. *tab.* 23.

Commeline does not point out any plant to which this has an affinity; nor do I find that it has been mentioned by any botanist since, except by M. Poiret, who properly adopts *Tamagali,* the name given by the Brahmans, and considers it as having an affinity to the *Geoffrœa,* in the flowers and fruit at least, although the habit is different (*Enc. Méth.* vii. 560.). Nor can I form any conjecture more satisfactory, being quite unacquainted with the plant, or with anything like it. The Malabar name implies an affinity with the *Elæocarpus* (*Perin Kara*), both belonging to the genus *Kara* of the natives, but the flowers seem so different, that this arrangement must be quite unnatural, although adopted not only by the vulgar, but by the Brahmans, who call both this and the following plant by the generic name *Gale,* or *Gali.*

PERIN KARA, *p.* 51. *tab.* 24.

In the plate the specific name is by mistake *Perim.* Commeline in his observation justly remarks, that this *Kara* is a quite different species (genus in the Linnæan sense) from the former, and that it is not an *Olive,* as the Portuguese and Dutch pretend. Botanically speaking, no doubt, he is right; but the fruit of the *Perin Kara* has a resemblance so strong to an *Olive,* both in appearance and in several qualities, that it must strike every one; and accordingly the fruit of the *Olive* by the Bengalese is called *Jolpayi,* the name which they give to the *Perin Kara.* Both Commeline in the *Flora Malabarica,* and Ray in his History of Plants, called it "*Olea sylvestris Malabarica fructu dulci,*" a name by no means appropriate, as it is as much cultivated in India as the *Olive* is in Europe. Ray afterwards in the *Dendrologia* is said to have abandoned the idea of its being an *Olea,* and called it a *Prunus,* which was no improvement.

Plukenet in the *Mantissa* (175.) refers it, with doubt however, to page 355, line 26, of the *Almagestum,* which is, "*Sorbi Alpinæ* (*forte*) *species Arbor Americana durioribus serratis foliis ex Insula Jamaicæ,*" which, he says, is represented in *t.* 318. *f.* 1. of the *Phytographia*; but this figure seems to represent a *Justicia,* and there is certainly here some typographical error: *t.* 318. *f.* 2. has a considerable resemblance to the foliage of the *Perin Kara,* and may be that which Plukenet meant; but if it is a *Sorbus,* it can have no affinity to the *Perin Kara,* and at any rate, as a production of America, it is probably not the same plant.

Burman (*Thes. Zeyl.* 93. *t.* 40.) considered the *Perin Kara* as the same with the *Weralu* of the Ceylonese, which Herman took for a *Laurus*; but Burman properly constituted it a new genus, and called the plant "*Elaiocarpos folio Lauri serrato, floribus spicatis,*" and both are no doubt of the same genus, but I doubt much of their belonging to one species, for he says, "nucleum crispum;" but that of the *Perin Kara* is smooth; and this has rarely four divisions in the flower, while in the plant of Burman such seems to be the common number. Linnæus in the *Flora Zeylanica* (206.) changed the *Elaiocarpos* of Burman into *Elæocarpus,* and properly rejected the synonyma of Plukenet and Sloane, quoted by Burman, but he does not doubt of the *Weralu* and *Perin*

Kara being the same plant. In fact, however, he meant to describe the plant of Herman, because in the generic character he uses the words *nucleus crispus*, which are not applicable to the *Perin Kara*. In the *Species Plantarum* Linnæus gave the specific name *serrata*, which has been adopted by Burman (*Fl. Ind.* 120.) and Willdenow (*Sp. Pl.* ii. 1169.); and to the synonyma in the *Flora Zeylanica* was now added the *Ganitrus* of Rumphius (*Herb. Amb.* iii. 160. *t.* 101.), certainly very different from the *Perin Kara*, and probably from the *Weralu*. I think it, indeed, probable that Rumphius described the *Perin Kara* by the name of *Catiulican* (*Herb. Amb.* iii. 163.), of which he says, "ossiculum oblongum non excavatum, vel rugosum uti *Ganitri*, sed glabrum." With these discordant plants M. Lamarck (*Enc. Méth.* ii. 604.) has joined the *Dicera dentata* of Forster, which, from the figure that he gives (*Ill. Gen. t.* 459. *f.* 1.), seems abundantly different. The only authority quoted in the *Hortus Kewensis* (iii. 301.) is the *Thesaurus Zeylanicus*; but the plant described in this being different from the *Perin Kara* in the collection of dried specimens presented to the library at the India House, I have called the latter *Elæocarpus Perincara*. I shall here describe its fruit, for by this part alone can the different species of *Elæocarpus* be rightly distinguished.

Drupa acida *Olivæ majoris* similis, supera, glabra, carnosa, subobovata, basi umbilicata. *Putamen* osseum, suturis tribus spuriis læve, oblongum, utrinque attenuatum, paulo incurvum, abortu forte uniloculare, loculo ad unum latus propinquiori, angusto. *Semen* oblongum, utrinque acutum, non compressum. *Perispermum* album. *Embryo* centralis, erectus.

Manil, seu Manyl Kara, *p.* 53. *tab.* 25.

Here is another species of the unnatural Malabar genus *Kara*, or *Gale*. All the names used in Malabar allude to its having been introduced from Manilla or China, into which, again, it may have been introduced by the Spaniards from America. On account of its having been thus imported from China, Commeline carelessly compares it to the *Pruno similis fructus Chinensis* of C. Bauhin, and to the *Lechya* of the Chinese.

Rumphius (*Herb. Amb.* iii. 20.), while he corrects the errors of Commeline, confounds the *Manil Kara* with his *Metrosideros macassariensis*; and Burman

in his observation is so convinced of their identity, that he copies the description of the *Manil Kara* in order to complete the defective account given by Rumphius. Willdenow, however, justly separates the plants of Rumphius and Rheede, calling the former *Mimusops Kauki* (*Sp. Pl.* ii. 326.), and the latter *Achras dissecta* (*Sp. Pl.* ii. 223.), which Willdenow says is the same with the *A. Balata* of Aublet.

The *Manyl Kara* by M. Poiret (*Enc. Méth.* iv. 434.) was called *Imbricaria Malabarica*; but he remarked, that the genus *Imbricaria* of Commerson could scarcely be considered as distinct from *Mimusops*. Afterwards (*Enc. Méth.* vi. 530.) he found that the *Manyl Kara* is not different from the *Achras dissecta* of Willdenow, and the *A. Balata* of Aublet; but he prefers the name given by the latter. In Gangetic India I have found near towns, and probably exotic, what I take to be the *Manil Kara*, and have given a dried specimen to the library at the India House. This tree is called *Kshirni* in the Bengalese dialect; and Dr. Roxburgh says that the *Kshirni* is the *Mimusops Kauki* (*Hort. Beng.* 25.), but he does not quote the *Hortus Malabaricus*. Unless there be here some mistake, the *Mimusops Kauki* of Dr. Roxburgh is not that of Linnæus, but the *Achras dissecta*, which is in fact a *Mimusops*. It is true that Mr. R. Brown (*Nov. Holl.* i. 531.) considers the *Mimusops hexandra* of Dr. Roxburgh as scarcely different from the *Achras dissecta*; but in the *Hortus Bengalensis* we have both a *Mimusops Kauki* and a *M. hexandra*, and this leads to a suspicion of there being some mistake about the *Kshirni*. Perhaps the plant that was so called to me may have been the *M. hexandra* of Dr. Roxburgh, and the name *Kshirni* may be applicable to both species. At any rate the *Manil Kara* cannot be the *M. Kauki* of Linnæus, if that has eight *stamina*, as Mr. Brown seems to suppose.

I must here observe, that concerning the genus *Mimusops* there seems to be a fatality of confusion; as Burman (*Thes. Zeyl.* 133.) for the *Kauken Indorum* quotes the *Elenzi* of the *Hortus Malabaricus*, and Herman, (*Mus. Zeyl. p.* 33.), and says that it is the *Murumal* of the Ceylonese; while Linnæus in the *Flora Zeylanica* (137, 138.) says that both species of *Mimusops* are called by the Ceylonese *Munamul*, or *Manghunamul*, and quotes p. 23. of Herman for the *Kauken* of Burman.

KARA ANGOLAM, *p.* 55. *tab.* 26.

Another species of *Angolam,* as Commeline remarks, has been already noticed (*tab.* 17.). It seems strange that the Brahmans of Malabar should not consider this as of the same genus, calling the one *Angolam,* and the other *Namidou*; but here I suspect some error in Rheede, who in such matters was by no means careful.

Ray, in calling this plant *Prunifera Indica,* threw no light on its history; and, so far as I can learn, it continued unnoticed by authors until quoted by M. Lamarck (*Enc. Méth.* i. 174.), who called it *Alangium hexapetalum.* M. Poiret is of opinion that the *Diatoma* of Loureiro is not a different species (*Enc. Méth. Suppl.* ii. 469.; v. 551.). It must however be observed, that the stigma of the *Diatoma* is said to be divided into lobes, while that of the *Kara Angolam* is represented quite entire, which would imply a more material difference. I have even some suspicion that the *Diatoma* may be the *Kare Kandel* of the *Hortus Malabaricus* (v. *t.* 13.), to a consideration of which I shall have occasion again to return.

The "*Arbor baccifera Maderaspatana Mali Citriæ foliis, nonnihil scabris, fructu coronato, gemello, ad sinum foliorum, pediculis curtis insidente*" of Plukenet (*Amalth.* 24. *t.* 370. *f.* 1.), which M. Lamarck quotes, with doubt indeed, for his *Alangium hexapetalum,* cannot I think belong to this genus, the habit is so different, especially as Plukenet in general has a singular felicity in expressing this point.

Vahl and Willdenow (*Sp. Pl.* ii. 1175.) take the *Alangium hexapetalum* from Lamarck. Dr. Roxburgh in the *Hortus Bengalensis* has an *Alangium hexapetalum,* which he says grows there spontaneously. This, as he does not quote the *Hortus Malabaricus,* leads me to suspect that his plant may be the *Diatoma* of Loureiro, for I have never seen the *Alangium hexapetalum.* The *Alangium tomentosum* (*Enc. Méth.* i. 174.) is indeed very common in the woods everywhere south from the Ganges, and I shall here describe it. In the Hindwi dialect it is called *Dhela.*

Arbor magna. *Ramuli* teretes, pubescentes, brevioribus apice sæpe spinescentibus. *Folia* alterna, ovato-oblonga, acuta, integerrima, costata, nervis

subtus reticulata, supra pilis brevissimis raris, subtus longioribus densioribus pubescentia. *Petiolus* brevissimus, teres, supra planiusculus, tomentosus.

Flores ex anni præteriti foliorum axillis sæpius gemini, gemma foliosa interposita subsessiles, odorati, subalbidi. *Bracteæ* squamaceæ.

Calyx superus, brevissimus, suboctodentatus. *Petala* circiter octo, linearia, revoluta, imo calyci inserta. *Filamenta* plura, indefinita, extra germinis discum inserta, ad medium erecta, barbata. *Antheræ* lineares. *Germen* turbinatum, disco magno concavo intra calycem coronatum. *Stylus* staminibus longior, incrassatus. *Stigma* magnum, simplex.

Drupa nucis moschatæ magnitudine ovalis, calyce cylindrico coronata, nigra, corticosa. *Cortex* mollis, crassus. *Pulpa* alba, mollis, nuci adhærens, dulcis. *Nux* ovata, acuminata. *Funis* umbilicalis e basi nucis ad seminis apicem decurrens. *Semen* ovatum, acuminatum, amarum. *Integumenta* gemina, tenuissima. *Albumen* forma seminis album. *Embryo* inversus, rectus. *Radicula* teres. *Cotyledones* foliaceæ, planæ, nerosæ, vmagnæ, tenues.

In the woods of Magadha I found a tree called *Cphota Gandai* in the Hindwi dialect, which, notwithstanding the difference of name, had a most striking resemblance to the above, only its leaves were larger, and smooth and shining on the upper side. I did not, however, see either flower or fruit. I have given a specimen to the library at the India House.

Theka, seu Thekka, *p.* 57. *tab.* 27.

We have here four plants of a native genus called *Thekka* by the vulgar, and *Sailo* (erroneously on the plate *Saiko*) by the Brahmans of Malabar; but, as Commeline justly observes, they have no similitude, nor do any two of them belong even to the same natural order. The prototype of this genus produces one of the finest timbers for the shipwright or house-builder, on which account it seems early to have attracted notice; and, as Commeline mentions, was described by Bontius and Nieuhof, two early writers on the Eastern Archipelago, who compare it to the *Oak*, which, however, it resembles in the qualities of the wood alone. Plukenet mentions it merely by the

names of Rheede and Bontius; but states (*Mant.* 178.) that it grows in the Island of Johanna, which would seem to show that it is an African as well as an Asiatic production. Plukenet, it must be observed, takes no notice whatever of this plant in the *Almagestum*; much less does he compare it to the *Terebinthus,* as the elder Burman alleges in his note on Rumphius.

This latter author is the first after Rheede who gives an account of this tree, which he calls *Jatus,* from its Malay name *Jati,* signifying, as Rumphius observes, *durable,* and by no means, as Commeline imagined, the name of the *Oak,* a tree totally unknown to the natives.

After Rumphius, this valuable tree continued unnoticed by botanists, until the younger Linnæus published the *Supplementum,* in which he called it *Tectona grandis,* by a very forced and irregular derivation from τεκτων, *faber,* a word never, I believe, applied to the material on which the workman operates. In the modern rage, however, for Greek, the name has been generally received (*Willd. Sp. Pl.* i. 1088.; *Hort. Beng.* 17.; *Hort. Kew.* ii. 12.), although Jussieu (*Gen. Plant.* 121.), M. Lamarck (*Ill. Gen. t.* 136.), and M. Poiret (*Enc. Méth.* vii. 592.), most justly prefer the Malabar name *Theka.*

In the kingdom of Ava this valuable tree is called *Kiun*; but there is still more common another species of the same genus called *Ta-la-hat,* which, although very ornamental, is nearly useless. Its leaves, however, serve cabinet-makers for polishing their work. I shall here give a description of this tree, of which I sent to England specimens and a drawing, that were given to Sir Joseph Banks; but a copy of the drawing is in the library at the India House. I shall here premise, that, although Jussieu places the *Theka* among the *Vitices,* I am with all submission inclined to think it more nearly allied to the *Borragineæ,* on account of the number of *stamina* and regularity of its *corolla.*

THEKA TERNIFOLIA.

Habitat in Avæ collibus sterilissimis.

Arbor inter minores. *Rami* hexagoni, obtusanguli; juniores trisulci, lanati. *Folia* terna, elliptica, integerrima, acuta, costata, venis reticulata; supra papillosa, hispida, ad nervos pilosa; subtus tomento albo, molli pubescentia. *Petiolus* brevissimus, semiteres, tomentosus, non stipulaceus. Inter tomentum pili nonnulli stellati.

Corymbi axillares, terni, folio longiores, patentes, ramosissimi, divisionibus inferioribus 3- seu 5-fidis, superioribus dichotomis; flore in dichotomia sessili. *Rami* tomentosi, rigidi. *Bracteæ* ad corymbi divisiones singulas binæ, lineares, pubescentes. *Flores* parvi, cœrulei, erecti.

Calyx monophyllus, persistens, superne ampliatus, laciniis reflexis, ovatis quinquefidus. *Corolla* monopetala, infundibuliformis; *tubus* longitudine calycis supra dilatatus, ore patente, quinquangulari intus pilosus: *limbus* reflexus, laciniis ovatis, obtusis quinquepartitus. *Filamenta* quinque, subulata, erecta, longitudine pilorum apici tubi inserta. *Antheræ* cordatæ. *Germen* in fundo calycis minutum. *Stylus* longitudine staminum teres. *Stigma* lobis acutis bifidum.

Nux calycis fundo aucto tecta, laciniis coronata, oblonga, lævis, quadrilocularis, tetrasperma.

Katou Theka, seu Catu Tekka, *p.* 59. *tab.* 28.

The specific names *Katou* and *Vana* have the same meaning, properly enough translated "wilde" by the Dutch. The Brahmans of Malabar for this plant would appear to have two generic names, *Sailo* and *Papalou*, the first a very rude attempt at classification, uniting it with the *Theka robusta.* Concerning the name *Papalou* I know nothing.

I have already (*Linn. Trans.* xiii. 549.) mentioned the error into which Burman fell respecting this plant, which subsequent authors have not yet introduced into the system; but M. Poiret (*Enc. Méth.* v. 1.) makes some pertinent remarks on the subject. If the fruit is above the calyx, he thinks that it must belong to the order of *Verbenaceæ*; but like the *Theka* it has five stamina and a regular corolla, on which account it comes nearer the *Borragineæ.* M. Poiret, however, confesses that the fruit has every appearance of being crowned by the calyx, in which case it must belong to the order of *Rubiaceæ,* and it is nearly allied to the genus *Psychotria,* only it would seem to have but one seed, while the *Psychotrias* have two. But although the fruit is represented in the figure with only one seed, yet little reliance can be placed on this circumstance, many plants being subject to the failure of one seed, where the regular number in a complete fruit is two or more. On the whole, it is probable that this plant possesses the generic character of *Webera,* as given

by Willdenow (*Sp. Pl.* 1224.), although not that given by Gærtner, which is taken from the *Cupi* of Rheede, as I have observed in my Commentary on the *Hortus Malabaricus, Part* II. 37. *t.* 23. As Willdenow saw specimens of his *Webera corymbosa*, if he had an opportunity of examining the fruit, we may suppose that it possessed the generic character which he attributes to it. As in this case the *Cupi* of Rheede must have been quoted by mistake, we may perhaps be allowed to conjecture that the *Catu Tekka* is Willdenow's *Webera corymbosa.*

TSJEROU THEKA, seu TSJERU TEKA, *p.* 61. *tab.* 29.

This is another very dissimilar plant which the natives of Malabar include in the same genus with the *Theka robusta.* By some strange mistake Plukenet refers it (*Mant.* 26.) to his "*Arbuscula Barbadensis amplexicaulis triphyllos*" (*Alm.* 48.; *Phyt. t.* 145. *f.* 4.). I have not yet found the *Tsjerou Theka* quoted in any subsequent author; but it is evidently a *Clerodendrum*, as that genus is defined by Jussieu (*Ann. du Mus.* vii.) and R. Brown (*Nov. Holl.* i. 310.). I found, however, in Mysore a plant which I have little doubt is the same, and which both Dr. Roxburgh and I consider as the *Volkameria serrata* (*Willd. Sp. Pl.* iii. 384.). In Nepal and in the northern parts of Bengal I have since found a variety of the same plant which, although it differs a good deal in appearance at first sight, is in every respect of its structure so similar, that I cannot consider it a different species. I shall here describe at length the plant of Mysore, and then notice the few points in which the plant of Nepal differs. Specimens of the former, together with a drawing, I gave to Sir J. E. Smith; and I have since presented specimens from Bengal to the library at the India House.

CLERODENDRUM SERRATUM.

Habitat ad sylvarum margines in Carnata.

Radix crassa, lignosa, amara. *Caulis* lignosus, duos pedes altus, erectus, sulco ex ima folii parte utrinque decurrente angulatus, lævis, simplex. *Rami* pauci, breves, axillares, oppositi vel terni. *Folia* aliquando opposita, sæpius terna, subsessilia, oblonga vel elliptica vel cuneiformia, serrata, sæpius ovata, aliquando obtusa, glabra, costata, venosa, non stipulacea.

Panicula terminalis, erecta, folio longior, obtusa, densa. *Rami* oppositi ve.

terni, trichotomi, tomentosi. *Bracteæ* ovatæ vel oblongæ, acutæ, integerrimæ, pubescentes, persistentes, ad singulas paniculæ divisiones oppositæ vel ternæ. *Flores* magni, cœrulescentes, laciniarum intermedia saturatiore.

Calyx turbinatus, quinquedentatus. *Corollæ tubus* calyce duplo longior, crassus, teres: *limbus* patentissimus, quinquepartitus laciniis ovato-oblongis, secundis, intermedia longiore, concava, ad basin bisulca. *Filamenta* ex tubi apice didynama, subulata, parallelo approximata, basi pilis unita, fissuram versus petali summam declinata, dein incurva. *Antheræ* oblongæ. *Germen* superum, subrotundum. *Stylus* subulatus, staminibus longior. *Stigma* bifidum, acutum, lacinia superiore breviore.

Bacca depresso-turbinata, quadriloba, e quatuor coalitis composita, quadrilocularis, calyce infra obtecta. *Semina* solitaria, globosa, nonnullis sæpe abortientibus.

Varietas *α*.

Buya Tældar *Bengalensium*.

Huriya montanorum *Hindice*.

Habitat in Bengala boreali, et Nepala.

Frutex sex pedes altus, subscandens, ramis tetragonis.

Ben Theka, seu Teka, *p*. 63. *tab*. 30.

Here is another species of the badly constructed Hindu genus *Theka*, or *Sailo*. *Ben*, the specific name, implies 'white.' In subsequent authors I cannot trace any mention of this plant, which seems to belong to the order of *Solaneæ*.

Iripa, *p*. 65. *tab*. 31.

In a commentary on the *Herbarium Amboinense* (i. 167.) I have said all that occurs to me as necessary concerning this plant, which is usually considered as the *Cynometra ramiflora* of Linnæus.

Kalesjam, seu Calesani, *p*. 67. *tab*. 32.

The latter name should probably have been engraved *Calesam*. *Kalesjiam* is a generic name common in India, but seems very irregularly applied; for I have found it given to one of the *Asclepiadeæ*, as well as to the two following plants, which have a stronger affinity. The *Mourmouratarum* of the Brah-

mans is a word which I cannot trace, as in Sanskrita the tree is named *Jivala*, which the Bengalese corrupt into *Jiyal*; and in the Hindwi language the name is *Kashmulla* or *Kusambhar*.

Commeline justly remarks, that what Rheede calls the second kind of fruit must be considered as an excrescence similar to the gall-nut on the Oak, that is, as the work of an insect. Ray, as usual, gave this plant a new name, suitable to his ideas of arrangement; but no subsequent author, so far as I can trace, has attempted to class the *Kalesjam*, only M. Lamarck (*Enc. Méth.* i. 559.) considers it allied to *Brucea*, *Comocladia*, *Rhus*, and other genera among the *Terebinthaceæ*. In this I have no doubt of his being right; and I can scarcely think that it possesses characters sufficient to distinguish it from the genus *Rhus*. Dr. Roxburgh however, I believe, described it under the name of *Odina Woodier* (*Hort. Beng.* 29.), although he does not quote the *Hortus Malabaricus*; but I know his plant, which is very common in Bengal, and I have found it also in Kankana and in the adjacent parts of Karnata, in which latter country it is called *Godela*, under which name I gave specimens to Sir J. E. Smith, while I gave others to the library at the India House under both the name used by Dr. Roxburgh, and as the *Rhus Odina*, which I consider as the most proper designation. Under this I shall here give an account of the tree, taken from notes made in my journey to Mysore.

Arbor magnitudine mediocris, succo resinoso scatens. *Rami* cicatricibus obcordatis exasperati. *Folia* decidua, alterna, cum impari pinnata, apices versus ramulorum congesta, non stipulacea. *Pinnæ* oppositæ, bi- vel trijugæ, integerrimæ, latere posteriore ad basin latiore obliquæ.

Paniculæ utriusque sexus ante folia prodeuntes e gemma terminali, at post foliationem laterales, compositæ ramis sparsis, patentibus, pubescentibus. *Bracteæ* infra singulas paniculas, quasi petiolorum rudimenta, subulatæ. *Flores* fasciculati, parvi, intus lutei, extra rubicundi, diœci; sed in planta fœminea flores nonnulli masculi sæpe intermixti.

Masc. *Calyx* quadrifidus, parvus. *Petala* quatuor, margine revoluto oblonga, concava, obtusa, ungui lato calyci inserta. *Filamenta* sex, septem vel octo subulata, petalis breviora, alterna epipetala, alterna hypogyna. *Rudimentum* germinis superi minimum. *Stylus* brevis. *Stigma* quadrilobum.

Fœm. *Calyx* et *corolla* maris. *Stamina* octo circiter sterilia. *Germen* superum, oblongum. *Styli* quatuor remoti, brevissimi. *Stigmata* simplicia.

Drupa oblonga, compressa, punctis quatuor prope apicem notata. *Nux* solitaria, monosperma.

Katou Kalesjam, seu Catu Calesjam, *p.* 69. *tab.* 33.

Commeline considers this as having a greater resemblance to the *Sorbus* than to the preceding plant, with which it has been arranged by the people of Malabar, but in this he is I think mistaken, as this plant is one of the order of *Terebinthaceæ* very nearly allied to the genus *Schinus.* Ray and Plukenet, however, continue (*Alm.* 355.) to call this tree *Sorbus spuria Malabarica, Katou Kalesjam dicta*; nor do I find it mentioned in subsequent authors until it was quoted in the *Hortus Bengalensis* (33.) for the *Garuga pinnata* of Dr. Roxburgh, of which no description, so far as I know, has yet been published. I shall therefore here describe it, premising that in 1801 I collected specimens in Mysore, which I gave to Sir J. E. Smith under the name of *Ekeberga serrata,* while I have since presented to the library at the India House specimens from the North of India; for it is one of the most generally diffused trees in that country. In the Hindwi dialect of Kankana it is called *Mau,* a reduplication of which forms the word *Moemoe* used by the Brahmans of Malabar.

Arbor mediocris. *Rami* succo albido scatentes, cicatricibus obcordatis exasperati. *Folia* decidua, alterna, conferta, cum impari pinnata. *Foliola* novem circiter utrinque, oblonga, latere posteriore ad basin angustiore longiore obliqua, opposita, serrata, acuminata, costata, venosa, lateralibus subsessilibus, impari petiolato: insuper petiolo communi utrinque insidunt foliola duo vel tria minuta, falcata, quorum duo infima stipulas mentiuntur. *Petiolus* imam versus incrassatus, obsolete trigonus, foliolis longior, non stipulaceus.

Paniculæ plures, patentes, congestæ, terminales, ante folia prodeuntes; ramis subangulatis, pubescentibus, patentibus. *Bracteæ* squamiformes, caducæ, sparsæ.

Calyx deciduus, coloratus, ad basin intus disco hypogyno decemstriato vestitus, quinquefidus laciniis erectis acutis. *Petala* quinque oblonga, calyce paulo longiora, apice revoluta, ad calycis incisuras inserta. *Filamenta*

decem subulata alternis longioribus, pone disci crenas inserta. *Antheræ* oblongæ. *Germen* ovatum, quinqueloculare. *Stylus* teres longitudine staminum, et calycis. *Stigma* incrassatum, quinquelobum.

Bacca magnitudine nucis moschatæ subrotunda, loculo uno vel altero tantum fertili succulenta. *Semina* solitaria, integumento duro nuciculosa. *Perispermum* nullum. *Cotyledones* foliaceæ, plicatæ, virides.

In the woods of the Gorakhpur and Shahabad districts (Cosala and Cicata) I found three trees very nearly allied to the above; but as I saw two of them only in leaf, I do not know whether they belong even to the same genus; yet at the same time they so strongly resemble the *Catu Calesjam,* that I am not sure whether they can be considered as distinct species. Specimens of them all have been given to the library at the India House; and I shall here give the accounts which I took on the spot.

GARUGA? PHARHAD *Hindice.*

Habitat in Cicatæ sylvis.

Arbor mediocris. *Ramuli* crassi, teretes, cicatricibus reniformibus notati, juniores pilis erectis mollibus hirti. *Folia* alterna, cum impari pinnata, 4—6-juga. *Pinnæ* oppositæ, oblongæ, serraturis magnis obtusis incisæ, acuminatæ, costatæ, venis plurimis reticulatæ, utrinque pilis plurimis longis erectis hirtæ, basi acutiusculæ; laterales costis anterioribus longioribus obliquæ. *Petiolus* non stipulaceus, foliolis imis longior, basi incrassatus, subanceps, pilis plurimis longis hirtus. *Rachis* hirtus, teretiusculus. *Petioli* partiales hirti; laterales brevissimi, terminalis brevis.

GARUGA? KENGKAR *Hindice.*

Habitat in Cosalæ sylvis.

Foliola quam in præcedente minus hirta, molliora, 9—12-juga. *Folia* nunc fere glabra, tunc hirsuta nunc foliolis falcatis instructa, tunc destituta, unde dubito an a planta Roxburghii satis distincta.

GARUGA? KHAMAR *Hindice.*

Habitat in Cosalæ sylvis.

Folia decidua, impari pinnata, 5—7-juga, cum foliolis nonnullis parvis falcatis sæpe deciduis, quorum duo ima stipulas mentiuntur. *Foliola* oblongo-

ovata, latere posteriore angustato obliqua, acuta, serrata, costata, venis reticulata, subopposita; terminale pedicello elongato elevatum; novella pilosiuscula, sed ante maturitatem pili decidui.

Paniculæ ante folia erumpentes, facie terminales, sed foliis prodeuntibus novis infrafoliaceæ, ramosissimæ. *Rami* sparsi, angulati, divaricati, nudiusculi. *Bracteæ* squamiformes, vagæ, parvæ, caducæ. *Flores* odorati, e luteo rubescentes.

Calyx campanulatus, coloratus, intus disco decemcrenato vestitus, basi decemstriatus, quinquefidus. *Petala* quinque calycis laciniis duplo longiora, oblonga, disci apici inserta. *Filamenta* decem, crenis disci inserta subulata, alternis longioribus calycem æquantibus. *Germen* superum, stipiti crasso insidens, subrotundum. *Stylus* teres longitudine staminum. *Stigma* subrotundum quinquelobum.

Bacca calyce minuto emarcido insidens, magnitudine nucis Avellanæ turbinata, submucronata, quinquelocularis, loculis nonnullis semper fere abortientibus.

Ben Kalesjam, seu Calesam, *p.* 71. *tab.* 34.

The specific name *Ben*, applied to this species of *Calesam*, signifies 'white,' as *Katou*, applied to the former, signifies 'wild' or 'forest,' both terms equally applicable to each plant. The name given by the Brahmans of Malabar to the *Ben Kalesiam* in the text is stated to be *Mourmoura*; but on the plate it is said to be *Zelara*, a difference which I cannot reconcile.

Commeline justly remarks, that what is represented as the fruit is not in reality such, but must be considered excrementitious, as he expresses it, that is, a growth proceeding from the plant owing to an operation of insects, as M. Poiret justly observes (*Enc. Méth. Suppl.* i. 613.). This is the only modern author who mentions the plant, and he conjectures it to belong to the order of *Sapindi*; but I think that I have found in fructification a species of *Schinus*, which, if different, is very nearly alike to the *Ben Kalesjam*. It must, however, be admitted that the *Sapindi* and *Terebinthaceæ*, to which latter the *Schinus* belongs, have a very strong affinity, and are rather distinguished by minute differences of fructification than by any great variety of general appearance. I shall now describe the plant above mentioned, as perhaps the same with the *Ben Kalesjam*. Specimens have been given to the library at the India House.

SCHINUS SAHERIA.

Ben Kalesjam. *Hort. Malab.* iv. 71. *t.* 34.?

Saheri *Hindice.*

Habitat in Magadhæ sylvis.

Arbor magna, ramulis crassis tomentosis. *Folia* alterna, cum impari pinnata. *Foliola* 5—7-juga, opposita, petiolata, oblonga, acuminata, integerrima, supra nisi ad nervos nuda, subtus pilosa, costata, venis minute reticulata; lateralia costis posterioribus abbreviatis subsemiovata; terminale basi acutum. *Petiolus* communis basi incrassatus, subangulatus, pubescens, mediocris, non stipulaceus. *Rachis* ad foliola nodosus, angulatus, pubescens. *Petioli* partiales, utrinque incrassati, canaliculati, pubescentes, brevissimi, terminali cæteris duplo longiore.

Paniculæ in ramulo novo infrafoliaceæ, vel ex axillis foliorum inferiorum, folio breviores, angulatæ, pubescentes. *Ramuli* alterni, breves, subquinquefidi, id est bis bifidi, bifurcatione primaria florifera. *Bracteæ* vix ullæ. *Flores* parvi, herbacei.

Calyx minimus, quinquefidus, concavus, disco decemcrenato tectus; crenis alternis latioribus, dorso emarginatis. *Petala* quinque ovata, pubescentia, patula, ungue lato perigyna, calyce alterna, crenis disci latioribus opposita. *Filamenta* decem disci margini inserta, basi lato subulata, petalis breviora, quinque petalis opposita cæteris paulo longiora. *Antheræ* cordatæ. *Germen* ovatum disco immersum. *Stylus* nullus. *Stigma* obtusum, pilosum.

The tree above described was probably a male; nor did I either see female flowers or fruit; but the latter is said to be an esculent berry. It flowers in spring; but the *Saheri,* which I saw in November, had "foliola serraturis magnis remotis incisa." I do not think, however, that on this account we can venture to consider it as a distinct species; and the circumstance connects it more fully with the *Ben Kalesjam,* and the plants described under the name of *Garuga.* It must be observed, that in the figure of Rheede none of the leaves are represented with a terminal leaflet; but the three lower leaves are evidently broken off to allow room for the painter, and the uppermost even is, I suspect, imperfect. It is this circumstance, however, which has made me quote the figure with doubt.

In the woods of the Rungpur district, on the north side of the Brahmaputra, I found a tree which, in the catalogue of specimens presented to the library at the India House, I call *Schinus Bengalensis,* and which is very nearly allied to the above, as will appear from the following description.

Arbor magnitudine mediocris odore terebinthaceo. *Ramuli* pilis brevissimis herbaceis pubescentes. *Rami* teretes, cicatricibus parvis notati. *Folia* alterna, cum impari pinnata, 3—5-juga. *Foliola* subopposita, basi obliqua ovata, inæquilatera, acuminata, apicem versus serrata, omnia pedicellata, supra nuda, subtus pilis herbaceis raris pubescentia, venosa. *Petiolus* teres, pubescens. *Rachis* non alata.

Paniculæ axillares vel infrafoliaceæ, folio multo breviores, ramis alternis, teretibus, pubescentibus, paucifloris, divaricatis. *Flores* parvi, herbacei, omnes quos vidi pseudo-hermaphroditi, abortivi.

Calyx minimus, quinquedentatus. *Petala* quinque ungue lato. *Filamenta* decem, perigyna, petalis breviora. *Antheræ* parvæ. *Germen* ovatum, superum, minimum, disco decemcrenato circumdatum. *Stigmata* tria obsoleta, crassa.

In the woods on the opposite side of the Brahmaputra I some months later found a tree in fruit, which the natives called *Niyar,* and which, if it be different from the preceding, is remarkably like it; and I must observe that in this, as well as in the *Saheri,* the chief difference between the tree with adult foliage and that in flower is, that the leaves of the one are entire, and of the other serrated. I shall here transcribe the notes taken on the spot. Specimens may be found in the library at the India House.

SCHINUS NIARA.

Niyar *Bengalensium.*

Habitat in Camrupæ orientalis monticulis.

Arbor præcedenti simillima, sed foliola angustiora sæpius integerrima.

Bacca corticosa, supera, pulpo viscido cum *Euphoriæ* consistentia esculento farcta, 1—4-locularis seminibus varie abortientibus. *Nuciculæ* solitariæ, angulatæ. *Perispermum* nullum. *Cotyledones* foliaceæ, complicatæ, virides.

PONGA, seu PONGU, *p.* 73. *tab.* 35.

With his usual negligence respecting names, Rheede says in the letter-press that the Brahmans call this tree *Helay,* and in the plate that they call it *Calo Dumpu.* In one place he says that the Portuguese call it *Massao spinosa,* and in another, *Tsjaka do Mato*; and on this resemblance Commeline calls it *Jaca minor sylvestris Malabarica.* I must, however, say that the figure of the fruit, as represented dissected in the plate, has little resemblance to an *Artocarpus,* and seems to be composed of a number of one-leaved calyces, each terminated by spinescent divisions; nor is there any appearance either of sexual organs or seed.

Plukenet in my opinion was little more fortunate than Commeline, when he compared the *Ponga* (*Mant.* 42.) to his "*Cenchramidea arbor pilulifera, fructu tuberculis inæquali, ex granulis coniformibus in orbem glomerato, non capsularis*" (*Alm.* 92.; *Phyt. t.* 156. *f.* 3.), which has serrated leaves, and from its generic name *Cenchramidea,* as well as from its habit, should be a *Bubroma.*

The elder Burman erred much further in considering the *Ponga* as the same with the *Cussambium* of Rumphius (*Herb. Amb.* i. 157.), an opinion which it is strange the accuracy and acuteness of M. Lamarck (*Enc. Méth.* ii. 230.) should have allowed to be of any weight; for although he notices that the plants were essentially different, yet, giving too much credit to the opinion of Burman, he takes each leaflet of the *Cussambi* for a leaf, the leaves of the *Ponga* being simple, while those of the *Cussambi* are pinnated.

M. Poiret (*Enc. Méth.* v. 563.) is more fortunate in considering the *Ponga* as a *Papyrius* or *Broussonetia,* which I am inclined to think is actually the case; and I therefore suppose the figure of the dissected capitulum to represent the female flower before the singular receptaculum has elevated the seed. In the woods near Goyalpara, on the south side of the Brahmaputra, I have found, bearing ripe fruit, a species of this genus much in its foliage resembling the *Ponga*; but its fruit is much too small, and supported on too long footstalks to admit of its being the same species. In the catalogue of specimens presented to the library at the India House I have called it *Papyrius* seu *Broussonetia integrifolia,* a name equally applicable to the *Ponga*; but in order to distinguish them I shall here describe the plant, which I have seen.

Arbor mediocris, succo pellucido turgidus. *Ramuli* teretes, tomentosi. *Folia* alterna, oblonga, basi obtusa, acuminatissima, integerrima, costata, venis minutissime reticulata, supra nudiuscula, subtus pilosa. *Petiolus* brevissimus, teres, sulco supra exaratus. *Stipulæ* gemmaceæ, caducæ.

Flores non vidi. *Pedunculi* fructiferi axillares, sed folio deciduo plerumque nudati, sæpius ex eodem axillo quatuor bis bifidi, petiolo paulo longiores.

Bacca pisiformis, echinata, alba, composita e receptaculis circiter duodecem, receptaculo communi insidentibus, pulposis, apice umbilicato semina totidem gerentibus. *Semina* ovata, dura.

KARIIL, seu KARIL, *p.* 75. *tab.* 36.

Commeline's arrangement, in calling it *Arbor prunifera,* is a very rude attempt at classification, which, however, seems to have been quite satisfactory to the botanists of the day; for Plukenet, in imitation of Ray, not only called this an *Arbor prunifera,* but "*Prunus pentaphyllus Malabarica fructu calyci insidente*" (*Alm.* 306.; *Phyt. t.* 218. *f.* 4.). He, indeed, changed the Indian name *Kariil* into *Karyl*; but there can be no doubt, from the figure, that the *Kariil* is meant.

The elder Burman (*Thes. Zeyl.* 170.) seemed to think that this was the same with the *Telabo* of the Ceylonese, a tree with a remarkably fœtid wood. Rheede does not mention any such quality; and it is not likely to exist in the *Karil,* as he says, "*odor radicis terreus,—foliorum sylvestris.*" Burman, indeed, was so very careless in his synonyma, that little attention can be paid to his opinion. The *Telabo* by Herman had been called "*Nux Zeylanica folio multifido digitato, flore merdam olente,*" of which Plukenet gives a figure (*Phyt. t.* 208. *f.* 3.) representing the *Sterculia fœtida,* and as usual quotes (*Alm.* 266.; *Mant.* 137.) as synonymous all trees with an excrementitious smell, whether from Africa, Asia or America, or regardless of the part—flower or wood—which thus affects our senses. Burman, however, not only quotes for the *Telabo* the *Karil* of Rheede and Plukenet, but the *Telabo* of the latter, although he admits that Ray considered this as rather the *Cavalam* of Rheede (*Hort. Mal.* i. *t.* 49.), which is no doubt the *Sterculia Balanghas,* as different as possible from the *Karil*; for this latter evidently belongs to the order of *Verbenaceæ,* and Rheede says of his *Karil,* "*flores suaveolentes.*"

Linnæus, however, in the *Flora Zeylanica* (349.) continued to confound the *Karil* with the *Telabo* or *Sterculia foliis digitatis*, which in the *Species Plantarum* became the *Sterculia fœtida* (*Burm. Fl. Ind.* 207.), an error continued by Willdenow (*Sp. Pl.* ii. 874.), but corrected by M. Poiret (*Enc. Méth.* vii. 431.). The *Karil*, however, is the only authority quoted for the *S. fœtida* in the *Hortus Kewensis* (v. 339.); and, unless this is an error, the plant in that noble garden cannot be a *Sterculia*. It is evident from the figure that the flower of the *Karil* is monopetalous and irregular, with one stylus; but the stamina are not noticed, and the fruit is evidently a drupa, covered at the lower part by the calyx, and containing a nut with one seed, probably by abortion. Whether or not, from the stamina having been unnoticed by Rheede, we may infer that he saw only female flowers, is uncertain, the separation of the male from the female organs being very unusual if not unknown in the order of *Verbenaceæ*. If its flowers are actually diœcious, I know no such plant; but I suspect that Rheede may have overlooked the stamina as being closely connected with the stylus, a circumstance not unusual in didynamous flowers. In this case I have seen two species nearly allied to *Vitex*, that very nearly resemble both each other and the *Karil*. These I shall now describe, being uncertain which I should reckon most nearly allied to the plant of Rheede.

The first I found in Ava, and sent to England specimens, which are probably in the collection of Sir Joseph Banks under the name of *Vitex leucoxylon*, although I am not sure that it is the same with the plant so called by the younger Linnæus (*Willd. Sp. Pl.* iii. 392.; *Hort. Kew.* iv. 67.; *Hort. Beng.* 46.), for it is by no means remarkably like the *Vitex trifolia*.

Arbor elata. *Rami* tetragoni, obtusanguli, læves. *Folia* opposita, petiolata, ternata vel quinata. *Foliola* petiolata, elliptica, integerrima, acuta, supra nuda, subtus valde reticulata; exteriora minora. *Petiolus communis* semiteres, canaliculatus, mediocris, glaber, non stipulaceus: *partiales* breves, teretes, canaliculati.

Paniculæ axillares, dichotomæ, longitudine folii nutantes, nudæ. *Pedunculus* teres, glaber. *Bracteæ* vix ullæ. *Flores* cœrulescentes, magnitudine florum *Rosmarini*, incani.

Calyx quinquedentatus. *Corolla* quinquefida laciniis unilateralibus, obtusis;

quatuor subæquales; quinta major, coloratior, concava, crenata, ad basin barbata.

Drupa turbinata, compressa, ad basin calyce pentagono tecta. *Nux* oblonga, abortu forte bilocularis. *Semina* solitaria, hinc convexa inde plana.

The other plant, so nearly allied to the *Karil*, I found first in the north-west parts of Mysore, where it is called *Pounsi*; and afterwards in the north-east parts of Bengal. Specimens from the former I gave to Sir J. E. Smith, and from the latter to the library at the India House. Both sets of specimens I have marked *Vitex leucoxylon*, although there is the same objection to this being called by that name that I have mentioned when describing the former plant. I shall add a description of the *Pounsi* in flower, taken in Mysore, and of the fruit taken in Bengal.

Arbor mediocris ramulis compressiusculis, junioribus pubescentibus. *Folia* opposita, ternata vel quinata. *Foliola* petiolata, oblonga, apice nunc acuta, tunc obtusa, basi semper cuneata, integerrima, glabra, costata, venosa; exterius utrinque basi inferiore productiore obliquum. *Petiolus communis* semiteres, canaliculatus, pubescens, mediocris, non stipulaceus: *partiales* brevissimi, canaliculati.

Pedunculus axillaris, erectus, solitarius, teres, petiolo brevior, pubescens, dichotomus bifurcationibus floriferis. *Bracteæ* ad paniculæ divisiones minutæ, oppositæ. *Flores* subsessiles, albi.

Calyx erectus, quinquedentatus. *Corollæ tubus* incrassatus, calyce duplo longior ore compresso, obliquo: *limbus* planus, profunde quinquefidus: *laciniæ* quatuor superiores oblongæ, obtusæ, lateralibus paulo longioribus; ima maxima, medio barbata, rugosa, subunguiculata, reniformis, subcrenata. *Stamina* didynama, pilosa, parallelo-approximata, erecta. *Antheræ* parvæ, exsertæ. *Germen* superum. *Stylus* subulatus, situ et longitudine filamentorum majorum. *Stigmata* duo, acuta, æqualia.

Drupa olivæformis, calyce parvo integro plano suffulta, succulenta. *Nux* solitaria, oblonga, unilocularis, monosperma, sed hinc insculpta cavitate magna, substantia suberosa oppleta.

It is very probable that in the plant of Ava there may be a similar structure

of nut, as the cavity filled with a corky substance may have readily been mistaken for a *loculamentum* containing a seed. If such be the case, the fruit of these two plants will approach near in character to that of the *Gmelina*, and they will form a genus distinct enough from *Vitex*.

Vidi Maram, *p.* 77. *tab.* 37.

Maram signifying 'tree', the Malabar name is *Vidi*. In the letter-press Rheede says that the Brahmans call it *Quarenna*; but on the plate the name is *Salanti*. Neither name has any affinity to the *Bahuvaraka* of the Sanskrita, corrupted by the Bengalese into *Bahuari*; nor to *Lissaura*, the name by which several trees of this genus are called in the Hindwi dialect.

The older botanists under the name *Sebestena*, derived from *sepstan* of the Arabs, described a plant, of which some authors reckoned two varieties, the *Sebestena domestica* and *S. sylvestris*; and others, such as Plukenet, considered them as distinct species. He calls the former "*Prunus Sebestena domestica*" (*Alm.* 306.; *Phyt. t.* 217. *f.* 2.); and the *Vidi Maram* he calls "*Prunus Sebestena longiore folio Maderaspatensis*," referring to it the *Sebestena sylvestris* of C. Bauhin and Alpinus (*Alm.* 306.; *Phyt. t.* 217. *f.* 3.).

Rumphius (*Herb. Amb.* iii. 156.) considered the *Vidi Maram* as being his *Arbor glutinosa*; but the latter has only four or five divisions in the flower, while the *Vidi Maram* has six; and although Burman in his Commentary takes the *Arbor glutinosa* to be the *Sebestena*, Rumphius is far from countenancing such an opinion.

Linnæus adopted the opinion of there being only one species of *Sebestena*, which he called *Cordia Myxa* (*Burm. Fl. Ind.* 53.; *Willd. Sp. Pl.* i. 1072.), applying the Arabic name *Sebestena* to an American plant. It must, however, be observed, that neither figure of Plukenet nor that of Rheede can be reconciled with the specific character given by Burman and Willdenow from Linnæus; for in the figures the calyx is smooth, and the corymbus terminal, while in the definitions the calyx is said to be striated, and the corymbus lateral. M. Lamarck, therefore, justly suspected that the plant which Linnæus actually saw, was not that of Egypt, nor of Malabar, but an American tree, which M. Lamarck calls *Cordia lutea* (*Ill. Gen.* i. 421.), while the *Vidi Maram* he calls *Cordia officinalis* (*Ill. Gen.* i. 420. *t.* 96. *f.* 3.). This, however,

he admits to be the same with the *Sebestena domestica* seu *Myxa* of Commeline. Their identity, however, I think very doubtful; for the nut in the figure given by Lamarck and Gærtner (*De Sem.* i. *t.* 76.), and probably belonging to the Egyptian plant, has only two acute angles, while that of the *Vidi Maram* is quadrangular. It must be further remarked, that Commeline in his note states that the *Vidi Maram* had not been described by any author, nor does he venture to class it further than by calling it an *Arbor prunifera*; while the *Sebestena domestica* had been described by many authors, unless we suppose the plant so called by Commeline to be different from that described by the Bauhins.

M. Poiret (*Enc. Méth.* vii. 40.), while he admits the difficulty of ascertaining what plant Linnæus meant by his *Cordia Myxa,* retains the specific character given by Willdenow, and enumerates three varieties. The first is the plant of Egypt, at least as described by J. Bauhin and Forskhal, for he quotes C. Bauhin with doubt. The second variety is the *Vidi Maram* of India, the *Cordia officinalis* of Lamarck, and the *Sebestena domestica* of Commeline; but, as I have said, the plant figured by Lamarck seems different from the *Vidi Maram*; nor do I know any ground for supposing the *Sebestena domestica* of Commeline to be different from that of C. Bauhin. M. Poiret's third variety is the *Cordia obliqua* of Willdenow (*Sp. Pl.* i. 1072.).

I am by no means satisfied that I have ever seen the plant described by Rheede; and I must say, that the form, the pubescence, and the margins of the leaves of the plants, which in various parts of Gangetic India are called *Latora, Lisaura, Bahuyari, Baboyar,* and *Dhovoli,* vary so much, even on the same tree, that no reliance can be placed on characters drawn from thence. The leaves of these are sometimes rounded, at others sharp-pointed; sometimes smooth, and at others hairy; sometimes quite entire, at others slightly indented. All, however, agree in having three principal nerves meeting a little above the base, and in generally having terminal corymbi; and all, therefore, in certain states, agree tolerably with the figure in Plukenet (*Phyt. t.* 217. *f.* 3.), and with the *Vidi Maram*; but then the flowers of the latter have six divisions, and the plants of Gangetic India have five only. Figure 3. of Plukenet has also six stamina, and is no doubt the *Vidi Maram,* as he alleges; but the flower of figure 2., representing the Egyptian *Sebestena,* seems

entirely different from the *Vidi Maram*, the divisions being still more numerous and much smaller. Near Rungpur I met with a tree in fruit, which the natives called *Kusiyari*, and which had a fruit with a lentiform nut exactly as represented by Gærtner, and its foliage very much resembled figure 2. in Plukenet, its leaves being round; but I did not see the flower; and it unfortunately happens that I obtained no description of the fruit of the *Latora*, *Lisaura*, *Bahuyari*, *Baboyar*, or *Dhovoli*, the plants of Gangetic India, which I should have thought most likely to be the *Vidi Maram*, were it not for the latter having six divisions in the flower. In Mysore, again, I met with a tree called *Jilla* or *Haduga*, which, with a lentiform nut, had flowers divided into six. This I take to be the *Cordia obliqua* of Willdenow (*Sp. Pl.* i. 1072.), and under this name I gave specimens to Sir J. E. Smith; but from the form of its nut I think it cannot be the *Vidi Maram*; and from its being very hairy, it cannot, I think, be the *Kusiyari*, which is quite smooth.

I cannot say what plant Dr. Roxburgh called *Cordia Myxa*; but as he does not quote the *Hortus Malabaricus* (*Hort. Beng.* 17.), and calls it *Buhooari* and *Lasoora*, the same names with my *Bahuyari* and *Lisaura*, I think it probably is one of the plants belonging to Gangetic India that I have above mentioned; but whether or not it has a lentiform nut, like the *Kusiyari*, I cannot say.

In the *Hortus Kewensis* we have the *Vidi Maram* as the only authority for the "*Cordia Myxa* corymbis lateralibus, calycibus decemstriatis," neither of which characters belongs to the plant described by Rheede, nor to any other *Cordia* that I have seen in India. In the catalogue of dried specimens presented to the library at the India House, I have attempted to reduce the specimens of the trees, called to me *Latora*, *Lisaura*, *Bahuyari*, *Baboyar*, and *Dhovoli*, to three species, *Cordia Latora*, *C. Baboar*, and *C. Lisaura*; but I am very uncertain whether they are sufficiently distinct from each other, as some of them I saw only in leaf, some in flower, and some in fruit. Neither am I certain but that some one of them may be the *Vidi Maram*, while another may belong to the *C. Myxa* of Dr. Roxburgh, if that be different from the *Kusiyari*.

PONNA, seu PUNNA, *p.* 79. *tab.* 38.

In this work Commeline does not attempt to class the *Ponna*. It seems uncertain whether Plukenet was right in referring it to his "*Arbor Indica Mali*

Medicæ amplioribus foliis Maderaspatana" (*Alm.* 41. *t.* 147. *f.* 3.); for between two of the leaves in the very imperfect figure there is an appearance of stipulæ, as in the *Gardenia*; and in fact, the leaves in the figure are more like those of a *Gardenia* than those of the *Ponna*, which I do not recollect having seen near Madras, although it is common on the opposite coast of Malabar. Besides, if Plukenet was right in considering the "*Nux oleosa Dhumba Zeylonensibus dicta*," as the same with his "*Nux Bengalensis Juglandi folio, fructu orbiculari*," he has probably described the *Ponna* under that name, as *Domba* is its Ceylonese name. He indeed says that this *Nux Bengalensis* was procured from the Island of Barbadoes, nor can any leaf be more unlike that of the *Ponna* than the Walnut. In another part, however, he says, that he received the branch from the East Indies under the name *Ponakai*, that is, the fruit *Pona*, no doubt the same with *Ponna*. Notwithstanding, therefore, the unfortunate comparison of the leaves with those of the Wall-nut-tree, we may consider the *Nux Bengalensis Juglandis folio, fructu orbiculari* as the *Ponna*. It is true, that this tree is not a native of Bengal, nor is *Punakai* a Bengalese word, but belongs to Malabar. The ship, however, that brought the specimen may have last come from Bengal. In the passage of Plukenet last quoted, he confounds the *Dhumba* and *Ponna* with the Red-wood of Barbadoes and several other American trees, especially the Log-wood. This is no doubt erroneous; but it is possible that the *Ponna*, as Plukenet alleges, may be the *Palma Maria*, used by Spanish seamen for masts, because the tree so used by our English seamen is called *Poon*, nearly the same word with the *Punna* of Rheede, which from its size and form is well suited for the purpose. The *Poon* used, however, by our seamen I have heard of as rather a production of the Eastern Archipelago than of Malabar; and I presume that it is the *Calophyllum angustifolium* of the *Hortus Bengalensis* (41.), called *Poon* by the Malays.

Rumphius (*Herb. Amb.* ii. 215.) considered the *Ponna* as the same with his *Bintangor maritima* (*p.* 211.), although he admits that there are some differences, especially in so far as the *Ponna* is not stated to be a maritime plant like the *Bintangor*. The fact however is, that although Rheede does not call it a maritime plant, yet he says, "provenit ubique in Malabar locis nimirum arenosis." Now in this province such places are found only along the shore; and it is there only where I have seen it growing spontaneously (*Buchanan's*

Mysore, iii. 135.). There is, however, a more essential difference which really exists between the two trees. The *Ponna* forms widely extended groves or avenues near villages, with immense stately erect stems, as Rheede says, "estque vastæ magnitudinis, altitudine nonaginta, crassitie vero duodecim pedum mensuram circiter æquans." The *Bintangor*, again, although its stem is very large, grows in a row along the edge of the shore, between the other trees and the sea, over which its stem hangs obliquely. "Arbor ipsa est vastissima, tam crasso constans trunco, ut fere nulla ipsi similem quoad crassitiem gerat, atque hic, uti dictum est, nunquam erigitur, sed semper inclinat—ut vix sub ea decurrere quis possit, ac superior tantum trunci pars parum sese erigit, ita ut ejus viridis modo coma supra aquam sese extendat." Besides, the leaves of the *Bintangor* are emarginated ("superius subrotunda ac parum fissa, seu bifida"), which is by no means the case with the *Ponna*. The divisions of the flower are also more numerous, and the flowers themselves larger in the *Bintangor* than in the *Ponna*, being composed of nine or ten leaves, and as large as the flower of an Apple-tree, while the leaves in the flower of the *Ponna* are eight in number, and the flower is no larger than that of the *Hepatica*.

The elder Burman, however, both in his Commentary on Rumphius and in the *Thesaurus Zeylanicus* (131.), had no doubt of the *Bintangor maritima* being the same with the *Ponna*. The synonyma, however, which he gives probably belong to the plant of Ceylon, no doubt the same with that of Malabar, because he says, "arbor est inter Canelliferas frequens," that is, it grows in the sandy groves near the coast, like the *Ponna*, instead of lining the edge of the shore, like the *Bintangor*. Burman rejects the American synonyma adopted by Plukenet; and the only plant, except the *Bintangor* quoted by him, which seems to be different from the *Ponna*, is probably the *Focraha* of Madagascar, for it may be doubted whether a tree of Malabar is likely to be found in that island.

Older botanists, as Vaillant, rejecting the unmeaning generic names *Arbor Indica* of Plukenet, and *Prunifera seu Nucifera* of Ray, had called this tree *Kalophyllodendron*; but, this being barbarously long, Burman called the genus *Inophyllum*, and this species *I. flore octofido*; but Linnæus, with his usual spirit of innovation, changed the name given by his friend into *Calophyllum*, and in the *Flora Zeylanica* (201.) he called this species *C. foliis ovalibus*, omitting

properly the ***Bintangor*** of Rumphius, the leaves of which are not of this form. He retained, however, among the synonyma all the three plants of Plukenet, which have been already mentioned.

The younger Burman takes from the *Species Plantarum* the specific name *Inophyllum,* adds to the synonyma the *Bintangor* of Rumphius, and omits the only one of three species of Plukenet which I think belongs to the *Ponna,* that is, the *Nux bengalensis Juglandi folio fructu orbiculari* (*Alm.* 265.).

M. Lamarck (*Enc. Méth.* i. 553.) considers the *Ponna* as his *Calophyllum Inophyllum*; but this is not distinguished "foliis ovalibus," as Linnæus justly defines them, but "foliis obovatis." It is probable, therefore, that M. Lamarck actually described the *Focraha,* or *Fooraha,* of Madagascar, which he quotes as synonymous. The seeds of the *Ponna* indeed produce a lamp-oil; but I never heard of its producing, like the *Fooraha,* an odorous resin like the *Tacamaque* of Bourbon, the qualities attributed to which are totally different from those attributed by Rheede to the gum of the *Punna.* M. Lamarck also joins to the *Punna* the American *Calaba* described by Jacquin. Whether or not this is the Red-wood of Barbadoes, considered by Plukenet as the same with the *Punna,* I cannot say; but I suspect it is on no better authority that the *Calaba* and *Punna* are made one species. Linnæus, it must be observed, thought them different. Whether or not it is the *Calaba* or the *Fooraha* that M. Lamarck represents in his figure (*Ill. Gen. t.* 459.) I cannot say; but it certainly is not the *Punna.* Its leaves, like those of the *Bintangor maritima,* which M. Lamarck places among the synonyma of his *Calophyllum Inophyllum,* are emarginate; but the flowers are totally dissimilar to those of both the *Punna* and *Bintangor,* at least as represented in the figure with leaves (*a.*), which, if not taken from that work, strongly resembles the figure of the *Inophyllum flore quadrifido* of Burman (*Thes. Zeyl. t.* 60.). This, indeed, is quoted by Linnæus as representing the *C. Calaba*; but it certainly is totally different from the *Ponna.* Perhaps M. Lamarck intended that his figure should represent both his varieties, that marked *a,* belonging to one variety, and those marked *b, c, d, e, f, g, h,* belonging to the other variety; but no hint of this is given in the Supplement.

Willdenow makes little change on the synonyma (*Sp. Pl.* ii. 1159.) as they stood in the *Flora Indica* of Burman, only he omits that of the elder Burman

and the American tree of Plukenet, retaining, however, the *Bintangor*, and Plukenet's tree from Madras, which I think is probably a *Gardenia.* In his note, also, he changes the *Tacamaque* of M. Lamarck into *resina Tacamahaca dicta*; but the *Tacamahaca* of the *Encyclopédie* (v. 238.) is quite different from the *Tacamaque.*

In the *Hortus Kewensis* the *Bintangor*, as well as the tree of Plukenet, is properly omitted among the synonyma; and Dr. Roxburgh, who had received the *Bintangor* from the Eastern Islands, mentions it as a distinct species (*Hort. Beng.* 41.).

Gærtner (*De Sem.* i. 200. *t.* 43. *f.* 1.) omits both the *Ponna* and *Bintangor* among the synonyma of the *Calophyllum Inophyllum*, quôting alone Plukenet (*Phyt. t.* 147. *f.* 3.), who, as I have said, probably has given the figure of a *Gardenia.* Gærtner's description and figure, however, taken from a fruit in the collection of Sir Joseph Banks, no doubt belong to a *Calophyllum*, and are copied in Lamarck's figures marked *e, f, g, h.*

TSJEROU PONNA, seu TSJERU PUNNA, *p.* 81. *tab.* 39.

The name given by the Brahmans of Malabar to this tree in the letter-press is said to be *Cit* (*alba*) *Octi*, but in the plate it has been engraved *Undi*, probably by mistake. Both seem to be words peculiar to Malabar; for the tree is not a native of the North of India.

Ray and Plukenet (*Mant.* 57.) reckoned this tree a species of *Cornus*, for no other reason, that I can imagine, but that Rheede says, "fructus Cornis nostratibus cum figura tum magnitudine et substantia haud absimiles."

Herman had sent to Commeline, as the latter remarks in his note, the branch of a tree called by the Ceylonese *Kina*, which he considered as the *Tsjerou Ponna*, and he afterwards described a *Kina minor* (*Hin Kina* of the Ceylonese), both belonging, perhaps, to the same genus, although this is by no means certain. The elder Burman, however, considered the *Kina* as the same with the *Punna* of Rheede, and the *Hin Kina* as being the *Tsjerou Ponna*, in both which suppositions he was probably mistaken. He fortunately, however, gave an account and figure (*Thes. Zeyl.* 130. *t.* 60.) under the name of *Inophyllum flore quadrifido*, of what he thought the *Hin Kina* and *Tsjerou Ponna.* Neither his account, however, nor his figure agrees with those of

Rheede: the leaves in Burman are emarginate, those of Rheede are rounded; Burman says, "Petioli (pedunculi secundum Linnæum) ex alis foliorum oriuntur communiter solitarii trifidi;" but the flowers in the *Tsjerou Ponna* are evidently disposed in racemes, and are much larger than in the *Hin Kina* of Burman. Burman has increased the difficulty by annexing, as the same with the *Tsjerou Ponna* and *Hin Kina,* the *Calaba* of the West Indies described by Plumier, which, from the place of its growth, I suspect is neither the one nor the other.

Linnæus, in the *Flora Zeylanica* (202.), justly thought the *Domba,* or *Doba,* of the Ceylonese to be the *Ponna* of Malabar, while the *Kina* he considered as the *Tsjerou Ponna,* taking no notice of the *Hin Kina,* because probably he thought that both *Kina major* and *minor* formed only one species. Although he thus corrected one error of Burman, who did not consider the *Domba* as belonging to the same genus with the *Ponna* (*Thes. Zeyl.* 170.), he adopted Burman's erroneous synonyma for the *Tsjerou Ponna,* calling it the *Inophyllum flore quadrifido* of Burman, and the *Calaba folio Citri splendente* of Plumier, thus including in one species three plants, the *Kina* or *Tsjerou Ponna,* the *Hin Kina* or *Inophyllum flore quadrifido,* and the *Calaba.* His specific character, "*Calophyllum foliis ovatis obtusis,*" is applicable to neither the plant of Rheede nor that of Burman, the former having "folia obovata," and the latter "folia emarginata," and was, therefore, probably taken from the American plant, which may have been that in M. Cliffort's collection, from whence Linnæus first derived his knowledge of this *Calophyllum*; and on this account in the *Species Plantarum* he retained the American name *Calaba,* written *Caleba* by the younger Burman (*Fl. Ind.* 120.).

In treating of the *Punna,* I have already mentioned that M. Lamarck removed the *Calaba* of Jacquin and the *Inophyllum flore quadrifido* of Burman to his *C. Inophyllum,* and he thus leaves the *Tsjerou Ponna* to form a species by itself, in which I think he is perfectly right; but then he strangely gives it the American name *Calaba,* and he defines it as having "folia ovata," while the *Inophyllum* according to him has "folia obovata;" but in the figures of Rheede the only plant represented with *folia obovata* is the *Tsjerou Ponna.*

In Willdenow the *C. Calaba* of Linnæus is continued (*Sp. Pl.* ii. 1160.), comprehending the *Tsjerou Ponna* of Malabar, the *Hin Kina* of Ceylon, and

the *Calaba* of America; but he properly observes, that he possessed only the American kind, which was also probably the case with Linnæus; and he suspects, with reason, that the Asiatic plant is different.

MALLAM TODDALI, *p.* 83. *tab.* 40.

The Malabar genus *Toddali*, called *Bori* by the Brahmans, is very unnatural, this and the following species having only a very slight resemblance in the leaf, and none at all to the *Kaka Toddali* described in the next volume (p. 81.). In his note Commeline does not venture to class this species, although it has the utmost affinity and resemblance to a tree of the South of Europe which was well known to the early botanists, who called it *Lotus* s. *Celtis*.

Plukenet was equally unfortunate in tracing an affinity to the *Mallam Toddali*. When he first mentioned it in the *Almagestum* (237.), he quoted as synonymous the name given to it by Ray, who was no more successful than himself, calling it "*Baccifera Indica racemosa, florum staminulis, binis*, &c." From this it would appear that Ray was not aware of Rheede having described a female plant alone, and of his having mistaken the styli for stamina. Plukenet afterwards (*Alm.* 329.) suspected, without, however, being certain, that the *Mallam Toddali* might be his "*Salvifolia arbor orientalis foliis tenuissime crenatis*" (*Phyt. t.* 221. *f.* 4.), which, indeed, is probably a *Celtis*, but certainly a different one from the *Mallam Toddali*, as it has *pedunculus solitarius, uniflorus*, and the leaves much too narrow.

Even Linnæus, when he published the *Hortus Cliffortianus*, erred far in classing the *Mallam Toddali* with the *Ulmus*, although this was no doubt some approximation to a true arrangement, both belonging to the same natural order. When, however, he published the *Flora Zeylanica*, he had become sensible that the *Mallam Toddali* was of the same genus with the *Celtis*, or *Lotus* of old botanists, and called it "*Celtis foliis oblique cordatis subtus villosis*" (*Fl. Zeyl.* 369.), adding to it the *Arbor Ghæduba dicta*, s. *Gædhumba*, of Herman and Burman (*Thes. Zeyl.* 26. 102.), although they had not perceived this to be the same with the plant of Rheede. Linnæus also included among the synonyma the tree of Plukenet, which I have mentioned as different, and an American tree described by Sloane, and perhaps by Plumier, although the latter was quoted with doubt.

The younger Burman by some strange error quoted the *Mallam Toddali* for the *Rhamnus Napeca* (*Fl. Ind.* 60.); but he also properly quoted it (*Fl. Ind.* 218.), when he adopted from the *Species Plantarum* the specific name *Celtis orientalis.* He there quoted Plumier without doubt, but left out the plant of Sloane, as he ought to have done with the other, and as has been done by M. Lamarck (*Enc. Méth.* iv. 138.).

This excellent botanist perceived a resemblance between the *Celtis orientalis* and the *Papyrius spurius* of Kæmpfer, which, however, I have not been able to trace in the 5th Fasciculus of the *Amœnitates Exoticæ*; nor does Thunberg quote Kæmpfer for his *Celtis orientalis* (*Fl. Jap.* 114.): M. Lamarck, indeed, quotes him with doubt. This is also done by Willdenow (*Sp. Pl.* iv. 996.), who leaves out the American plants quoted by Linnæus, and seems to doubt of Plukenet's, as he gives it only on the authority of Burman.

The *Mallam Toddali* may therefore be considered as the only authority for the *Celtis orientalis*; but it is doubtful whether the specimens which Willdenow possessed belonged to the same plant; for in the specific character he says, "folia subtus cana," while Rheede says, "folia superne atro-viridia, inferne subviridia." Dr. Roxburgh does not quote the *Hortus Malabaricus* for his *Celtis orientalis* (*Hort. Beng.* 21.); and the plant called *C. orientalis* in the botanical garden at Calcutta has *folia subtus scabra, ad nervos tantum majores pilosa.* Unless, therefore, several species have been included under the name *C. orientalis,* we must admit that it is a plant subject to very considerable variations; and I have given to the library at the India House specimens of five trees, all as varieties of the *C. orientalis.* Some at least of these may prove to be distinct species; but in the mean time I shall here give such an imperfect account of them as I was able to collect in travelling; for I had no opportunity of tracing each in all the stages of its growth. They are called *Jivani* in the Sanscrita, *Jibana* in the Bengalese, and *Tilayi* in the Hindwi dialects.

1. Celtis orientalis, *α.*

Celtis orientalis. *Willd. Sp. Pl.* iv. 995.

Habitat ad pagos et sylvis Camrupæ.

Folia trinervia, supra scabra, subtus tomento cano, molli pubescentia.

2. Celtis orientalis, β.

Chamari Tilayi *Hindice.*

Habitat in Magadhæ sylvis.

The bark of this tree is used for tanning, as implied by the Hindwi specific name. As the natives distinguish it by a proper name, it is perhaps a different species, distinguished from the *Mallam Toddali* by the female pedunculus having only about three flowers. I have not seen the male tree, unless it be the 4th variety.

Arbor mediocris. *Rami* flexuosi, subangulati, pilis brevibus incumbentibus tecti. *Folia* alterna, oblonga, semicordata, serrata, acuminata, trinervia, nervis et venis minute reticulata, supra pilis raris rigidis incumbentibus aspersa, cæteroquin fere nuda, subtus tomento albido brevissimo inter nervos incana. *Petiolus* brevissimus, canaliculatus, pubescens. *Stipulæ* lineares, caducæ.

Pedunculi axillares, gemini, longitudine petioli erecti, squamulosi, floribus circiter tribus minutis instructi.

Calyx quinquepartitus, germini adpressus, parvus. *Germen* superum. *Stylus* nullus. *Stigmata* duo plumosa.

Drupa globosa, grano piperis minor, stigmatibus deplumatis coronata, nigra, succulenta, calyce minuto suffulta. *Nux* dura, monosperma.

3. Celtis orientalis, γ.

Celtis orientalis. *Enc. Méth.* iv. 138. excluso synonymo Plukenetii, cui pedunculus fœmineus uniflorus. *Burman Fl. Ind.* 218. exclusis synonymis Plukenetii et Plumieri.

Celtis foliis oblique cordatis serratis; subtus villosis. *Linn. Fl. Zeyl.* 369. exclusis synonymis suprascriptis et Sloanei.

Arbor Ghæduba dicta. *Burm. Thes. Zeyl.* 26. seu Gædhumba, 102.

Mallam Toddali. *Hort. Mal.* iv. 83. *t.* 40.

Janfung Garoensium.

Habitat in Camrupæ montosis.

Folia subtus tomento viridi pubescentia.

The inner bark of this tree, like that of the West Indian kind, consisting of

numerous reticulated fibres, forms a kind of natural cloth, used by the Garos for covering their nakedness.

4. Celtis orientalis, δ.

Habitat ad Cosalæ pagos.

Of this I saw only male trees. It resembles much the second variety, only the leaves are rougher; and perhaps it is merely the male plant of the same species.

Cymæ geminæ, axillares, folio multo breviores, multifloræ, squamulosæ. *Flores* parvi, virides.

Calyx quinquepartitus. *Stamina* quinque laciniis calycis opposita.

5. Celtis orientalis, ε.

Celtis orientalis. *Hort. Beng.* 21.

Habitat ad Indiæ Gangeticæ et Nepalæ pagos.

Folia subtus pallida, sed nuda.

In the woods of Magadha I found another tree called *Tilayi* in the Hindwi dialect; but it is, perhaps, the *Celtis Amboinensis* of Willdenow (*Sp. Pl.* iv. 997.), although this is by no means certain, for the sides of the leaves are seldom equal to the base, and it may be merely a rougher variety of the *C. orientalis*. It is, however, so rough, that the leaves are used by the natives for polishing horn. Specimens of this also will be found in the library at the India House.

Arbor parva. *Ramuli* flexuosi, pilis erectis hirti. *Folia* alterna, rigida, ovato-oblonga, basi emarginata sæpius subobliqua, acuminata, subquinque-nervia, serrata, venis minute reticulata, utrinque scaberrima, et pilis raris rigidis subhispida. *Petiolus* brevissimus, hirtus. *Stipulæ* geminæ, basi petioli insidentes, lineares, caducæ.

Cymæ fructiferæ axillares, geminæ, longitudine fere petioli patentes, multifloræ.

Drupa nigra, seminis Cannabini magnitudine, ovata, obtusa, stylis geminis coronata, calyce parvo quinquefido pubescenti cincta. *Nux* unica, dura, compressa, minuta.

In the woods of the northern parts of Bengal and Behar I have found a very

distinct species of *Celtis*, which may be the same that I sent to Dr. Roxburgh from Nepal in 1802, and that he called *C. tetrandra* (*Hort. Beng.* 21.); but of this I am not certain, because I have preserved no account of the plant which I sent. On this account, in the catalogue of specimens presented to the library at the India House, I have called this species *Celtis Acata*; for in the Hindwi dialect the tree is called *Akata* or *Kataya*, and in the Bengalese, *Sukati*. On account of there being only one female flower in the axil of each leaf, this may be the "*Salvifolia arbor orientalis foliis tenuissime crenatis*" of Plukenet (*Alm.* 329.; *Phyt. t.* 221. *f.* 4.), which may represent the *Akata* after the male flowers have fallen, and before the germen has greatly enlarged. As this plant has been confounded with the *Mallam Toddali*, I shall here describe it.

Arbor mediocris ligno, ut perhibent, duro. *Ramuli* bifarii, teretes, pubescentes. *Folia* alterna, acuminata, venosa, supra glabra, subtus nuda, nunc semiovata trinervia, tunc subcordata trinervata, laterum altero ad basin multo angustiore obliqua, lateris angustioris margine integerrimo, latioris piloso serrato. *Petiolus* brevissimus, canaliculatus, pubescens. *Stipulæ* geminæ, laterales, lineares, caducissimæ.

Pedunculi uniflori, setacei, fasciculati, fasciculis in ramuli parte inferiore denudatis omnino masculinis; in superiore axillaribus, androgynis, flore unico hermaphrodito, pluribus masculinis. *Flores* parvi, virides.

Herm. *Calyx* tetraphyllus, foliolis concavis obtusis. *Filamenta* quatuor, maturitate elastice desilientia. *Antheræ* utrinque emarginatæ. *Germen* superum, oblongum. *Stigmata* duo pilosa, sessilia.

Masc. *Calyx* et *stamina* ut in hermaphrodito. *Pistillum* nullum.

Pedunculus fructiferus axillaris, solitarius, rigidus, subulatus, pubescens, petiolo duplo longior, ebracteatus.

Drupa pisiformis, succulenta, flava. *Testa* crassa, dura, forma drupæ. *Semen* unicum sulco hinc exaratum. *Albumen* nullum. *Cotyledones* foliaceæ, incurvæ, radiculam crassam teretem convolventes.

Perin seu Perim Toddali, *p.* 85. *tab.* 41.

This plant, although classed by both the vulgar and the learned of Malabar in the same genus with the preceding, in the eyes of systematic botanists, as

Commeline observes, has no affinity with it. There are, however, considerable resemblances, such as alternate, serrated leaves, with one side wider than the other; lateral stipules; small, herbaceous, axillary flowers, and drupaceous fruits. Such are the characters of the genus *Bori* of the Brahmans, of which this is the prototype, the name being the same with the *Bayer* of the Hindwi dialect. The European botanists of these old times, such as Ray, often classed together plants having less resemblance; but another species of this genus *Bori* has been mentioned in treating of the *Nyalel* (*Hort. Malab.* iv. *p.* 37.), which seems to have little affinity with the other two.

The *Perin Toddali* is so very nearly allied to the *Jujuba* or *Zizyphus* of the Levant, that its affinities were recognised, as Commeline remarks, by C. Bauhin, who called it *Jujuba Indica*, although the native name, *Bora*, *Bor*, or *Ber*, was also used by some both of his predecessors and contemporaries, as is more fully explained by Plukenet (*Alm.* 199.), who adopts the name given by C. Bauhin. Like the *Zizyphus* of the Levant, the Indian plant contains two, if not more varieties. The first, which grows spontaneously, and in Bengal is used for rearing the Lac insect, seems to be the *Jujuba Indica spinosa, folio et fructu rotundo* of Plukenet (*Alm.* 199.), to which this botanist should have referred the *Perin Taddali.* The second variety is cultivated for its fruit, and seems to be that called by Plukenet *Jujuba Indica spinosa, folio et fructu longiori* (*Alm.* 199.). Rumphius justly considered these as varieties, such as occur in plants that are much cultivated, and he included both under the name of *Malum Indicum* (*Herb. Amb.* ii. 117. *t.* 36.), because the external and esculent part of the fruit has a very considerable resemblance in consistence and taste to an apple. The names of Plukenet were adopted by the elder Burman (*Thes. Zeyl.* 132.), who gives the two varieties as two species, the plant of Rheede being the *Ilanda* of the Ceylonese, although Burman does not quote it, but mentions it under another plant, to which, however, he confesses the figure of Rheede cannot be reconciled.

Linnæus in the *Flora Zeylanica* (89.), with his usual eagerness for innovation, united the genus *Zizyphus* with *Rhamnus*; but although he mentions only the *Ilanda*, he does not quote the *Perin Toddali*, for what reason I do not know, unless it was that Burman had not joined them. The younger Burman (*Fl. Ind.* 60.), adopting from the *Species Plantarum* the specific name *Rhamnus*

Jujuba, quotes the synonyma properly for the plant described by Rheede. I have already mentioned the strange error of this author in quoting the *Mallam Toddali* for the *Rhamnus Napeca,* which he calls *R. Napæa*; but respecting this unfortunate plant, misled by his father's Commentary on the *Herbarium Amboinense* (ii. 121.), he falls into another gross error, quoting for it the *Jujuba Indica spinosa, folio et fructu longiori* of Plukenet (*Phyt. t.* 216. *f.* 6.); but no such plant is figured in that place, which represents the *Prunus Zeylanica spinosa, longiori folio viridi, fructus ossiculo orbicularis scrobiculis referto,* while the *Jujuba* above mentioned is the cultivated variety of the *Zizyphus Jujuba.*

Gmelin, it would appear, was dissatisfied with the Linnæan genus *Rhamnus,* and attempted to introduce our Indian plant as the *Mansana*; but Jussieu, having restored the *Zizyphus* of Tournefort (*Gen. Pl.* 417.), has been followed by Willdenow, who calls our plant *Zizyphus Jujuba* (*Sp. Pl.* i. 104.), without making any material change in the synonyma or mentioning the cultivated variety; and, strange to say, places the genus in the *Pentandria Monogynia,* although it has no stylus and two stigmata. Willdenow continues in the error respecting the plants of Plukenet referred to the *Zizyphus Napeca,* which was pointed out by M. Lamarck (*Enc. Méth.* iii. 319.). This excellent botanist considered the *Jujuba Indica spinosa, folio et fructu longiori* of Plukene tas probably the same with his *Zizyphus mauritiana*; in which case, I am persuaded that this can only be admitted as a variety of the *Perin Toddali,* improved by cultivation, such as the specimens which I have presented to the library at the India House under the name of *Zizyphus mauritiana.* This variety grows in the highest perfection near Patna, and is there called *Bara Bayer.*

Arbuscula ramis flexuosis, pulvere canis. *Folia* ovata vel oblongo-ovata, basi sæpius obliqua, serraturis minutis denticulata, apice sæpius acuta, at aliquando, summitatibus quasi erosis, obtusa, trinervia, supra glabra, subtus farina alba tomentosa. *Petiolus* brevissimus, tomentosus, supra planiusculus. *Stipulæ* geminæ, nunc marcescentes, tunc in aculeos indurascentes, quorum unus erectus, alter recurvus.

Pedunculus communis axillaris, multiflorus, sæpius bifidus, folio multo brevior. *Flores* parvi, virides.

Calyx planiusculus, laciniis ovatis quinquefidus, fundo tectus disco plano, pentagono, cujus anguli emarginati. *Petala* e calycis incisuris quinque minuta. *Stamina* totidem petalis opposita, e disci crenis enata. *Germen* superum, ovatum. *Stigmata* duo sessilia, acuta.

Drupa magnitudine Pruni damasceni oblonga, ad basin calycis rudimento umbilicata, ad apicem cum mucrone obtusa, consistentia fere Mali carnosa, acido-dulcis. *Testa* crassa, bilocularis. *Semina* solitaria.

In iisdem locis crescit varietas altera, *Penel Bayer* dicta, cui folia ovalia, obtusa; fructus multo major, apice acutiusculus; quam præcipue spectare figura Rumphii videtur.

Kadali, *p.* 87. *tab.* 42.

I cannot trace the name *Naqueri,* or *Nakeri,* given by the Brahmans of Malabar, to any name used in the North of India. The Malabar genus *Kadali,* or *Nakeri,* of which this is the prototype, was by Herman, Commeline, and other botanists of that time, considered as a kind of *Cistus,* to which it is now held to have very little affinity. Several older botanists had described it by the name *Pineka,* which might have been preserved. Some botanists were little satisfied, even then, with this arrangement, and Plukenet distinguished the *Kadalis* by calling them *Cisti pulpiferi,* a circumstance to which, perhaps, modern botanists should have paid more attention, and which should have prevented them from adding such an enormous mass of plants to the *Melastoma* of the elder Burman. He gave this name to the *Cisti pulpiferi,* because the pulp contained in the fruit stains black the mouths of those by whom it is eaten. *Melastoma* is therefore only applicable with propriety to the *Cisti pulpiferi,* the fruit of which, being a berry, when ripe bursts at the sides, on which account the Ceylonese call it *Bowithya,* and the Bengalese use the generic term *Phutika,* or *Phutki,* to distinguish it from the kindred plants, which have capsules opening by regular apertures at the summit. To these last the terms *Rhexia* and *Osbeckia,* according to the number of their stamina, should be confined; but, as these genera stand in Willdenow, no one can say where to look for any species. Dr. Jack is therefore perfectly justified in restricting the *Melastomæ* to such species as have a *pericarpium baccatum* (*Linn. Trans.* xiv. 1.).

The elder Burman, although accurate respecting the genus, referred the *Kadali* to an improper species, quoting it for his *Melastoma quinquenervia hirta major, capitulis sericeis villosis* (*Thes. Zeyl.* 155. *t.* 73.); for Rheede says of his *Kadali*, "e pediculo ad apicem folii tres nervi crassiores transeunt:" and of the *Katou Kadali* he says, "folia *Kadali* foliis similia, at—per folii longitudinem non tres sed quinque nervi crassiores transeunt." Burman ought therefore to have quoted the *Kadali* for his *Melastoma scabra trinervia* (*Thes. Zeyl.* 154. *t.* 72.).

Linnæus in the *Flora Zeylanica* (171.) not only adopted this error of Burman, and quoted the *Kadali* with three nerves for his *Melastoma foliis lanceolato-ovatis scabris quinquenerviis*, but he also referred the *Katou Kadali* with five nerves to his *Melastoma foliis lanceolatis trinerviis scabris* (*Fl. Zeyl.* 76.). In fact, Linnæus in the *Flora Zeylanica* describes three species of *Melastoma*, as does also Burman; but as two of the former have three nerves, while two of the latter have five, if we can depend on this character, Linnæus must have been mistaken in considering his three plants the same with those of Burman; and it remains to be ascertained which of the two plants with three nerves described by Linnæus is that of Burman, and also which of the plants with five nerves described by Burman is that of Linnæus. As the *Kadali* has only three nerves, it is only with these that we have here to do; and, as I have observed, it cannot be either the plant of Burman or Linnæus to which these authors have referred it, because both have five nerves. An observation of Burman may serve to explain which of the plants with three nerves most resembles it. He says, (*Thes. Zeyl.* 156.,) "descriptio in *Hort. Malab.* accuratior est, et plantæ nostræ magis convenit, quam figura ibi expressa, quæ glaberrima ibi depicta est, quum tota sit scabra et hirsuta, quod vitium sæpius in *Hort. Malab.* observavi." Now Rheede says, "Ramuli—lanuginosi et asperi—folia —aspera, exiguis spinulis horrida." This description, upon which, as Burman says, we must rely, is applicable enough to the *Melastoma scabra trinervia* of Burman (*Thes. Zeyl.* 154. *t.* 72.), which, besides, has the flowers disposed in racemi like the *Kadali*, and of a similar size. Linnæus refers this plant of Burman to his *Melastoma foliis lanceolatis trinerviis glabris: margine hispidis*; but from the circumstances above mentioned, this would seem to be a mistake, and he should have quoted it for his *Melastoma foliis lanceolatis trinerviis*

scabris (*Fl. Zeyl.* 172.). In this further, Linnæus remarks, "calyces in racemos collecti, nec caulem terminantes ut in M. foliis quinquenerviis." The synonyma must be, therefore, almost totally changed, only it remains uncertain whether the *Hin Bothya* of the Ceylonese belongs to the *Kadali* or *Katou Kadali,* Linnæus giving it to the plant with three nerves, while Burman gives it to one with five. This can only be determined by an inspection of Herman's collection. In the mean time, we may consider as synonymous the following plants:

Kadali. *Hort. Malab.* iv. *t.* 42.
Melastoma scabra trinervia. *Burm. Thes. Zeyl.* 154. *t.* 72.
Melastoma foliis lanceolatis trinerviis scabris. *Linn. Fl. Zeyl.* 172.

Rumphius evidently described the *Kadali*, as he himself remarks, under the name of *Fragrarius niger* (*Herb. Amb.* iv. 137. *t.* 72.), which we may safely add to the synonyma; for in its leaves it has only three nerves.

In the *Flora Indica* of the younger Burman (104, 105.) most of the errors of the *Flora Zeylanica* are followed, while the *Kadali* and *Fragrarius niger* are quoted for the *Melastoma Malabathrica,* which is the *M. foliis quinquenerviis* of the *Flora Zeylanica*; and, still further, the same *Kadali*, joined with the *Fragrarius ruber* of Rumphius, which is probably not of the same genus or order, is also quoted for the *M. aspera*, the same with the *M. foliis lanceolatis trinerviis scabris* of the *Flora Zeylanica.* This latter opinion entirely coincides with mine; and, if copied from the *Species Plantarum* of Linnæus, removes his authority for making the *Kadali* the *M. Malabathrica,* and we may quote among the synonyma of the *Kadali* the *M. aspera* (*Burm. Fl. Ind.* 105.).

Willdenow still, however, persisted in quoting the *Kadali* and *Fragrarius niger* for the *M. Malabathrica,* although the only real authority for this plant is the elder Burman (*Thes. Zeyl. t.* 73.).

The *M. aspera* of M. La Desrousseaux (*Enc. Méth.* iv. 37.) is quite a different plant from that of Linnæus and Burman, being a native of Madagascar; and under the *M. Malabathrica* (36.) he quotes both the *Kadali* with three nerves and the *Katou Kadali* with five nerves; the latter, indeed, he quotes with doubt; yet his plant, according to his description, has five nerves, and what he says is perfectly applicable to the *M. Malabathrica* in everything

except the inflorescence, which he calls a panicle, whereas it consists of from one to five terminal flowers, each supported by an undivided pedunculus. This difference, however, may have arisen either from his having used the term panicle without strictly attending to its definition, or from his having taken this part of his description from the figure of the *Katou Kadali*: he could not take it from the *Kadali*, where the flowers are evidently disposed in racemes. The figure of the *M. Malabathrica*, however, given by M. Lamarck (*Ill. Gen. t.* 361. *f.* 1.) represents only three nerves, while the inflorescence is not a panicle, but three terminal one-flowered pedunculi, a difference between the figure and description for which I cannot account.

In the *Hortus Kewensis* neither *Kadali* nor *Katou Kadali* is quoted for the *M. Malabathrica* (iii. 46.), which I consider is proper, neither being the plant described by the elder Burman. The only figure quoted in the *Hortus Kewensis* is in the Botanical Magazine of Mr. Curtis (No. 529.), where, indeed, the *Kadali* and *Fragrarius niger* are quoted; but then the figure, by the number of nerves and the size of the flower, sufficiently shows that the *M. quinquenervia hirta major* of the elder Burman (*Thes. Zeyl.* 155. *t.* 73.) is actually meant.

In the *Hortus Bengalensis* (33.), in general very accurate, the *Kadali* is quoted for the *M. Malabathrica*, which, therefore, should be added to the synonyma of the *M. aspera* of Burman; and the *M. aspera* of Dr. Roxburgh must be some other plant, which I have had no means of ascertaining; but it may perhaps be the following, or *Ben Kadali.*

Dr. Jack, in his valuable paper already mentioned (4.), quotes as usual the *Kadali* and *Fragrarius niger* for his *M. Malabathrica*; but the leaves of his plant have five nerves, and it is not therefore that of Rheede and Rumphius; nor, on account of its inflorescence, is it the plant of Burman (*Thes. Zeyl. t.* 73.), which I presume is Dr. Jack's *M. obvoluta.*

Ben Kadali, *p.* 89.

No figure is given of this plant; but as it is stated to be very like the preceding, we may infer that its leaves have three nerves, and therefore, as I have said, it may be the *M. aspera* of Dr. Roxburgh. It is evidently a very distinct species from the *Kadali*, and also from the *Melastoma Malabathrica* of Curtis, both of which have the alternate stamina much longer than the other five;

but Rheede says of the *Ben Kadali*, "filamenta decem—uniformia." It therefore belongs to Dr. Jack's division called *Stomandra* (*Linn. Trans.* xiv. 10.); but does not seem to have been described by him.

Katou Kadali, *p.* 91. *tab.* 43., by mistake on the Plate called Kalou Kadali.

What I have said respecting the two last plants must be carefully kept in view while we consider this. Commeline in his Commentary looked upon it as the *Maha Bothya* of Herman, and it should therefore be the *Melastoma quinquenervia hirta major, capitulis sericeis villosis* of the elder Burman, and the *Melastoma foliis lanceolato-ovatis scabris quinquenerviis* of the *Flora Zeylanica* (171.), now called *M. Malabathrica.* I have, however, no doubt that Commeline was mistaken; and that, although the *Katou Kadali* has five nerves, it cannot, on account of its smaller flowers and of its paniculated structure, be the same with the *Maha Bothya* of Herman, and with the plant of Burman and Linnæus, although these authors no doubt have erred in joining their plant with the *Kadali*, which has only three nerves. Burman, indeed, was perfectly aware of Commeline's error, and therefore with great propriety considered the *Katou Kadali* as a distinct species from the *Maha Bothya*, and called it *Melastoma quinquenervia minor, capitulis villosis* (*Thes. Zeyl.* 154.), giving its synonyma rightly, so far as I know, except in joining with it a plant of Jamaica, now called *M. discolor* (*Willd. Sp. Pl.* ii. 599.). From Burman we also learn that the *Katou Kadali* is the *Hin Bothya* of Herman, which, together with Burman's *Melastoma quinquenervia minor, capitulis villosis*, Linnæus unaccountably joined with his *Melastoma foliis lanceolatis trinerviis scabris* (*Fl. Zeyl.* 172.), which is now called *Melastoma aspera* (*Willd. Sp. Pl.* ii. 583.). For this, however, Willdenow has properly omitted the synonyma of Herman and Rheede; and, as I have before observed, it is in reality the *Kadali* of the latter.

Plukenet (*Alm.* 106.) described a plant, which he called *Cistus Chamærhododendros* s. *Ledum orientale, pentaneuros, foliis brevioribus, ferruginea et molli lanugine villosis.* This, according to him, is the *Maha Bothya* of the Ceylonese; but he proposed the *Katou Kadali*, with doubt, as synonymous, not willing entirely to contradict Commeline, and yet seeming aware of the objections to his opinion. Plukenet's plant, it must be observed, is not called a *Cistus*

pulpiferus, his name for the genus *Melastoma*; but he uses the term *Cistus Chamærhododendros,* implying probably its having a capsule like the *Rhododendron,* and therefore its being an *Osbeckia* or *Rhexia.* But further, his plant is in fact only called *pentaneuros* by mistake; for in the figure referred to (*Phyt. t.* 161. *f.* 2.), it is represented with seven nerves, and in the *Phytographia* is called *Cistus Chamærhododendros heptaneuros.* It is therefore as different from the *Katou Kadali,* as that is from the *Kadali.*

M. Desrousseaux, however, (*Enc. Méth.* iv. 36.) seems to have entertained no doubt that the plant of Plukenet was the same with the *Katou Kadali,* and seems to consider them as the same with the *M. Malabathrica,* although he quotes them with doubt. If, indeed, it is insisted on that Rheede must have described the *M. Malabathrica,* then the only plant of his, that we can consider as such, must be the *Katou Kadali,* on which account I quoted it in the catalogue of specimens presented to the India House; but I am now convinced that the *M. Malabathrica* is not described in the *Hortus Malabaricus,* and that the *Katou Kadali* has not yet been properly introduced into the modern system of botany.

Tsjerou Kadali *p.* 93. *tab.* 44.

Commeline justly remarks, that this is also a species of *Cistus,* in the sense then adopted by botanists, that is, it is a *Melastoma.* Plukenet (*Mant.* 49.) called it "*Cistus orientalis pulpifer, Jujubinis foliis trinerviis, capsula parva.*" I cannot, however, discover that the *Tsjerou Kadali* has been mentioned by any subsequent writer.

Oepata, *p.* 95. *tab.* 45.

Commeline is uncertain whether this may not be the *Anacardium,* meaning, no doubt, the *A. orientale,* and the seed of the *Oepata* has, no doubt, a certain resemblance to that nut; but even the fruits are entirely different in structure, nor have the trees any affinity. Plukenet, however, quoted the *Oepata* among the synonyma of the *A. orientale* (*Alm.* 28.). Linnæus continued in the same error, calling this plant *Avicennia* (*Fl. Zeyl.* 57.), for he perceived that it could not belong to the same genus with the *Kapa Mava* or *Arajou* of the West Indies, to which he had given the generic name *Anacardium.* Along with the *Oepata,* however, he quoted for his *Avicennia* the true *Anacardium* or *A. ori-*

entale, and that without any mark of doubt, although both Commeline and Plukenet had expressed uncertainty. That Linnæus, however, by his *Avicennia* meant the *Oepata,* and not the *Anacardium,* we may judge from his having placed it in the class *Tetrandria.*

Rumphius, under the name *Mangium album,* no doubt described (*Herb. Amb.* iii. 115. *t.* 76.) a species of *Avicennia.* Concerning this he says, "juxta regionum varietatem varias exhibens species seu varietates." He then goes on to describe the kind most common in Amboyna, which, both from the figure and account, would appear to differ from the *Oepata,* to which, however, the kind growing in Macassar seems to have a greater affinity. Neither Rumphius nor his commentator Burman quotes the *Oepata,* nor hints at any similarity between the plants.

When the younger Burman published his *Flora Indica* (138.), Linnæus, under the name of *Bontia germinans,* had joined the *Oepata* and true *Anacardium,* not only in the same genus, but in the same species with the *Bontia* of Jacquin and Browne (quite different from the *Bontia* of Plumier), an American plant with hairy leaves. The *Oepata,* no doubt, belongs to the same genus with the *Bontia* of Jacquin; but Rheede's words, "folia glabra," might have cautioned Linnæus against including them in one species; and a proper consideration of Rheede's account of the fruit might have shown that it could not be the *Anacardium,* then well known in the shops.

The younger Linnæus having described the *Anacardium* under the name of *Semecarpus Anacardium,* it might have been expected that the *Oepata* might have been separated; but Willdenow, having confined the name *Bontia* to the genus of Plumier, returned to the *Avicennia tomentosa* (*Sp. Pl.* iii. 395.), including in one species not only the *Bontia* of Jacquin, but the *Oepata,* and even the *Anacardium.* As, however, he retains in his specific character the term "folia tomentosa," it is probable that his specimen belonged to the West Indian plant. Yet, as he quoted the *Oepata,* Dr. Roxburgh considered this as the *Avicennia tomentosa* (*Hort. Beng.* 46.); for, although he does not quote the *Hortus Malabaricus,* I know the plant which he received from Mr. Goodlad to have been the *Oepata.* This may possibly be the *Sceura marina* of Forskahl, quoted also for the *A. tomentosa* by Willdenow; for it is more likely that the plant of Arabia or Egypt should be the same with that of India than with that of

Jamaica; and, if we must have the *Oepata* to be found in the West Indies, it should be rather the *Avicennia nitida* than the *A. tomentosa*, for its leaves, if not shining on both sides, are at least smooth.

M. Lamarck (*Enc. Méth.* i. 330.) entirely rejects the Linnæan error of confounding the *Oepata* with the *Anacardium*; but he retains that of uniting it with the hairy-leaved plant of the West Indies; yet the figure which he gives (*Ill. Gen. t.* 540.) of the *A. tomentosa* is evidently very different from the *Oepata*, having the flower in racemes instead of panicles; nor does it even agree with his own specific character, "A. foliis ovato-oblongis, subtus tomentosis," for the leaves are lanceolated; and I suspect that it, in fact, represents neither the *Oepata* nor the West Indian *Bontia*, although M. Poiret (*Enc. Méth. Suppl.* i. 539.) refers us to it for the *Avicennia tomentosa*. On the whole, the figure given by M. Lamarck bears a stronger resemblance to the *Mangium album* than to the *Oepata*, although its leaves are still narrower and sharper than even in the figure of Rumphius.

Mr. R. Brown for his *Avicennia tomentosa* (*Nov. Holl.* i. 518.) quotes neither Rheede, nor Rumphius, nor the *Bontia* of the West Indies; but he considers the *A. resinifera* (*Willd. Sp. Pl.* iii. 395.) as the same; and I suspect that this is the plant figured by M. Lamarck. We may therefore, on the whole, consider the *Oepata* as not yet introduced into the system of modern botany, on which account, in the catalogue of dried specimens presented to the library at the India House, I have mentioned it as follows:

AVICENNIA OEPATA.

Avicennia tomentosa. *Hort. Beng.* 46.
Avicennia. *Linn. Fl. Zeyl.* 57. (exclusis synonymorum tribus prioribus.)
Mangium album. *Herb. Amb.* iii. 115. *t.* 76?
Oepata. *Hort. Malab.* iv. 95. *t.* 45.
Sa-mæk ruæk-wum *Barmanorum.*

Habitat ad littora maris cœnosa in India et intra et ultra Gangem.

On my return from Ava to Calcutta, specimens and a drawing of the *Oepata* were transmitted to Europe, and given to Sir Joseph Banks, while a copy of the drawing remains at the India House. I shall here annex a description.

Arbor magna ramis glabris, fuscis, teretibus, oppositis, divaricatis; ramulis tetragonis. *Folia* opposita, elliptica, apice obtusa, basi acutiuscula, integerrima, venis reticulata, supra nitida, subtus nuda. *Petiolus* brevis, supra carinatus, apicem versus depressus, nudus, amplexicaulis, non stipulaceus.

Panicula terminalis, supra decomposito-trifida, ramis quadrangularibus, compressis, nudis. *Flores* terminales tres seu quatuor congesti, nudi, parvi, erecti, flavescentes.

Calyx octophyllus, foliolis duplice serie positis, ovatis, obtusis, concavis, imbricatis, interioribus longioribus. *Corollæ* monopetalæ tubus longitudine calycis crassus: *limbus* quadripartitus, laciniis obtusis, suprema breviore, latiore. *Filamenta* e corollæ incisuris quatuor, subulata, patentia, corolla breviora, duobus inferioribus brevioribus. *Antheræ* bisulcæ, oblongæ. *Germen* superum, ovatum. *Stylus* subulatus, staminibus brevior, adscendens. *Stigma* simplex, acutum.

Semen calyce minuto basi suffultum, nudum, compressum, ovatum, apice obliquo acutum. *Integumentum* coriaceum, pubescens, uno latere dehiscens. *Albumen* nullum. *Cotyledones* crassæ, magnitudine et forma seminis conduplicatæ, hinc radiculam versus auriculatæ. *Radicula* crassa, descendens, pilis albis barbata. *Plumula* bifida, glabra. *Plumula* et *radicula* e cotyledonum commissura hinc inter auriculas enascentes, et in sinu exterioris cotyledonum, interioris dorso tectæ, nidulantes.

Mr. R. Brown places this genus in the natural order which he calls *Myopoinæ,* confessing at the same time that it does not possess the true characters of these plants, and admitting that it is related to the *Verbenaceæ,* with which it is classed by Jussieu. I must confess that, notwithstanding what my very intelligent and acute friend advances (*Prodr. Nov. Holl.* i. 533.), I think Rumphius was right in placing the *Avicennia* next to the *Ægiceras,* the plant, in my opinion, to which it has the greatest affinity; and I think, therefore, that it should have been rather placed among the *Myrsineæ* than among the *Myoporineæ,* should such natural orders be retained.

WADOUKA, *p.* 97. *tab.* 46.

In my commentary on the *Idou Moulli* I have mentioned the error into which Plukenet seems to have fallen concerning these plants. Commeline gives no opinion concerning this tree; nor, except the erroneous quotation of it by Plukenet, do I find it noticed by any subsequent author. Its fruit, as Rheede observes, has a considerable resemblance to that of the *Nyalel* (*t.* 16.); but the two trees in other respects have no affinity, and the *Nyalel* is as unknown as the *Wadouka*. The description and figure of the *Wadouka* seem to refer entirely to a female plant, which, from its habit, and from the structure of its fruit, especially of its seed, would appear to have an affinity to the order of *Capparides*, although there is no appearance of the germen being supported on a pedicel.

RAVA POU, seu PU, *p.* 99. *tab.* 47, 48.

Pu signifying a flower, *Rava* is the proper name of the plant. Neither this nor the *Marotina* given by the Brahmans has any connexion with the term *tristis* given by the Portuguese, and adopted by Commeline, who on this account classes it most improperly with the *Mania Pu Maram* (*Hort. Malab.* i. 35. *tab.* 21.), and places them both in the genus *Jasminum*, to which the *Rava Pou* has not the smallest resemblance.

Linnæus having founded a genus called *Nyctanthes*, placed in it not only both the *Mania* and *Rava*, but also some plants which have nearly the fructification of the *Jasminum* (*Burm. Fl. Ind.* 4.), and thus the *Rava Pou* was called *Nyctanthes hirsuta*.

M. Sonnerat, having figured a plant under the name of *Cadamba*, Jussieu considered it as the same with the *Rava Pou* and as a species of *Guettarda* (*Gen. Pl.* 230.). M. Lamarck adopted the same opinions, and considered the *Cadamba* and *Rava Pou* as identically the same with the *Guettarda speciosa* of Linnæus (*Enc. Méth.* iii. 53.). Willdenow, however, was of a contrary opinion, and insisted not only that the *Rava Pou* was different from the *Cadamba*, but that it is a *Jasminum*, which he calls *hirsutum* (*Sp. Pl.* i. 36.), as being the *Nyctanthes hirsuta* of Linnæus; for these two genera he admits to be the same. He supports his opinion by referring to a figure by some person named Browne; but I see no such figure quoted among the synonyma even in his

own work, much less in any other. I must, however, confess that M. Lamarck's figure of the *Guettarda speciosa* (*Ill. Gen. t.* 154. *f.* 3.) seems to me to differ materially from the *Rava Pou* both in the form of the leaf and inflorescence; nor is the *Rava Pou* quoted either in the *Hortus Kewensis* (v. 279.) or *Hortus Bengalensis* (86.) for the *Guettarda speciosa,* although it is usually referred to by the authors, where they do not know some evident objection. Still, I think, there can be no doubt of the *Rava Pou* being a *Guettarda,* and totally different from the *Jasminum hirsutum,* as established by our worthy President (vide *Enc. Méth. Suppl.* iii. 713.); but it may probably be a species of *Guettarda* not yet introduced into the modern system of botany, nor have I seen the plant.

Anavinga, *p.* 101. *tab.* 49.

Commeline does not venture to propose any arrangement for this plant. Plukenet retains the Indian name; and Ray might as well have done so, for by calling it a *Baccifera Indica* he adds nothing to our knowledge. The elder Burman made some advance in comparing it, although with doubt, to his "*Grossularia spinis vidua, baccis in racemo congestis, spadiceis, foliis crenatis, ovato-acuminatis*" (*Thes. Zeyl.* 111. *t.* 48.), which has, no doubt, a considerable resemblance; but as he ascribes to his plant many stamina, while Rheede defines their number to be six in each flower, we may consider them as certainly distinct. Still further, if Burman attended to the situation of the germen in comparing his plant to the *Grossularia,* it must belong even to a different order from the *Anavinga,* the calyx of which is evidently below the fruit. That Burman, however, paid any attention to this circumstance is doubtful; and I am inclined to think that his *Grossularia* is, in fact, nearly allied to the *Anavinga,* although certainly a different species. The Ceylonese name of Burman's *Grossularia spinis vidua,* &c., according to him, is *Æmbilla,* and Linnæus mentions three plants of this name (*Fl. Zeyl.* 357. 403. 410.), of which the last may possibly be that figured by Burman, although Linnæus considered it as his *Ceanothus* (*Fl. Zeyl.* 28.). At any rate, none of the three Æmbillas seems to be the *Anavinga,* which is not mentioned in the *Flora Zeylanica,* nor in the subsequent works of Linnæus.

M. Lamarck first introduced the plant into the modern systems of botany. From M. Sonnerat he received specimens of a plant, which he considered as

belonging to the same genus with the *Anavinga,* and which he called by this name. The plant of Rheede he has introduced from that author's description, and called *Anavinga ovata* (*Enc. Méth.* i. 148.). Jussieu, although he considers this genus as the same with the *Casearia* of Jacquin, prefers the name *Anavinga*; but Willdenow prefers *Casearia,* probably thinking that Jacquin, having preceded Lamarck, had the best title to give a name; but he should perhaps have recollected that Rheede preceded Jacquin. By Willdenow the *Anavinga* of Rheede is called *Casearia ovata* (*Sp. Pl.* ii. 629.); but neither he nor any recent botanist seems to have seen the plant.

In the woods of Gangetic India I have indeed found a tree nearly resembling the *Anavinga,* and in the Bengalese dialect called *Kanjial.* I have presented specimens of this to the library at the India House under the name of *Samyda Canziala*; for, until the fructification of all the species constituting the genera *Samyda, Casearia, Anavinga, Pitumba, Iroucana, Athenæa, Melistaurum, Guidonia, Lœtia, Chætocrater,* and *Clasta* are more fully ascertained, I think it most prudent to include all under the Linnæan name *Samyda*; and these, with the *Aquilaria,* or *Agallochum,* and the *Gyrinops Walla* of Gærtner (*De Sem.* ii. 276. *t.* 140. *f.* 6.), form a very natural assemblage of plants, which Jussieu places among the *incertæ sedis*; but I think them nearly allied to the *Thymelææ.* They differ, however, in the following respects: *calyx* abbreviatus; *squamæ* corolliformes; *pericarpium* determinate dehiscens. I shall here describe the *Kanjiala* of the Bengalese, as observed in the Rungpur district (Camrupa).

Frutex sex pedes altus ramulis novis teretibus pilosis. *Folia* alterna, oblongo-ovata, latere anteriore latiore plerumque obliqua, costata, venosissima, serrulata; *adulta* nuda, acuta; *juniora* obtusa, subtus pubescentia. *Petiolus* brevissimus, depressus: *adultus* nudus; *junior* pilosus. *Stipulæ* geminæ laterales, minimæ, deciduæ.

Pedunculi plures axillares, congesti, sed sæpius in ramis anni præteriti, ob folia decidua nudati, quasi infrafoliacei, breves, uniflori, teretes, pubescentes, squamula ad basin bracteati. *Flores* parvi, herbacei, extra pubescentes.

Calyx foliolis subrotundis, concavis, duobus exterioribus angustioribus, quinque-partitus, fundo vestitus disco concavo, ad marginem producto in

squamulas octo, clavatus, barbatus. *Filamenta* octo, disco inter squamulas inserta, longitudine calycis subulata. *Antheræ* parvæ. *Germen* superum, ovatum. *Stylus* crassus. *Stigma* truncatum.

In specimens which were collected in the woods of Gorakpur (Cosala), the plant was arboreous, and the stamina varied from five to nine.

It is evident that the *Anavinga* of Rheede differs somewhat, especially from the plant found in Rungpur. *Folia* basi acuta, serraturis paucis remotis incisa. *Flores* solitarii, vel pauci pediculo communi solitario insidentes, quadrifidi. *Stamina* sex. It is, however, to be remarked in both the varieties which I have seen, as well as in the *Anavinga*, that the number of stamina in no respect corresponds with the number of divisions in the calyx; and therefore Rheede is not to be suspected of inaccuracy in giving his *Anavinga* six stamina, as M. Lamarck is inclined to think (*Enc. Méth.* i. 148.).

Among the Indian plants, which I have referred to the genus *Samyda*, I have observed two very distinct kinds of fruit, which may form a ground for separating them into two genera. In the one, the seeds are indefinite in number; but whether or not this is the case in the *Kanjiala* above described I cannot say, not having seen the fruit. As the *Anavinga*, however, evidently has a fruit of this kind, I shall here describe some plants which also belong to this division, and of which I have given specimens to the library at the India House. In the other division, the seeds, as in the *Agallochum*, are of a definite number; but I shall have occasion to consider these when I come to treat of the *Tsjerou Kanneli* in the fifth volume.

I shall first describe a tree, in the Hindwi dialect called *Konijal*, which is a strong presumption that the *Kanjial* of the Bengalese, above described, has a fruit similar to the *Anavinga*, for the two names are the same.

SAMYDA PISCICIDA.

Casearia elliptica. *Willd. Sp. Pl.* ii. 623.?
Anavinga lanceolata. *Enc. Méth.* i. 148.?
Konijal *Hindice.*

Habitat in Magadhæ et Mithilæ sylvis.

Arbuscula ramulis subangulatis pubescentibus. *Folia* alterna, bifaria, supra

nuda, subtus pilosa, costata, venis minute reticulata, oblongo-ovata, sed forma varia, basi sæpius obliquiuscula et subcordata, apice sæpius obtusiuscula, sed utrinque sæpe acuta, nunc serrata, tunc fere integerrima. *Petiolus* brevissimus, semiteres, pubescens. *Stipulæ* geminæ, laterales, caducæ, parvæ.

Pedunculi uniflori, axillares, congesti, folio caduco sæpe nudati, longitudine petioli. *Bracteæ* vix ullæ. *Flores* parvi, virides.

Calyx patulus, laciniis subrotundis concavis quinquepartitus, fundo tectus disco planiusculo, membranaceo, ore libero decempartito, laciniis linearibus, pubescentibus, calyce brevioribus. *Corolla* nulla. *Filamenta* decem, denticulis disci alterna, disci margini inserta, longitudine calycis subulata. *Antheræ* parvæ, cordatæ.

Fructus piscicidus, magnitudine Pruni minoris, pedicello multo longior, nunc obsolete hexagonus, tunc sulcis sex profundis costatus, oblongus, calyci parvo insidens, unilocularis. *Parietes* crassæ, succulentæ, sublactescentes, maturitate trivalves. *Capsula* dehiscente semina, pulpo involuta, in centro permanentia. *Receptacula* tria angulis parietum alternis longitudinaliter adnata, carnosa. *Semina* plura in pulpo ramentaceo sanguineo horizontaliter nidulantia, receptaculis annexa. *Albumen* carnosum. *Embryo* erectus. *Cotyledones* subrotundæ, planæ.

Samyda glabra.

Lohajang *Hindice*.

Habitat in Magadhæ montosis.

Arbor ramulis obtusangulis, glabris. *Folia* alterna, bifaria, subovalia, utrinque sæpius acutiuscula, et apicem versus latiora, at forma varia, serrata, costata, venis minute reticulata, utrinque glabra. *Petiolus* brevissimus, compressus, nudus, canaliculatus. *Stipulæ* geminæ, laterales, caducæ, ovatæ, acuminatæ.

Flores non vidi. *Fructus* ex axilla folii anni præteriti nudatus, pedunculatus, solitarius vel geminus, sescunciam longus, flavus, nutans. *Pedunculus* crassus, teres, brevissimus.

Capsula calyci parvo, quinquefido, patulo insidens, oblonga, utrinque obtusa, obsolete trigona, parietibus succulentis trivalvis, unilocularis ; semina post

capsulæ dehiscentiam pulpo involuta, in centro permanentia. *Receptacula* tria medio valvularum longitudinaliter adnata, carnosa, bifariam dentata. *Semina* plura in pulpo purpureo succulento ramentaceo nidulantia, receptaculorum denticulis insidentia, angulata. *Albumen* album. *Embryo* rectus. *Cotyledones* planæ.

Corondi, seu Courondi, *p.* 103. *tab.* 50.

Commeline mentions that this tree had been described by Zanoni under the name of *Corundi*, but gives no hint at its affinities.

Plukenet (*Alm.* 307.) described a tree of the West Indies, which the Caribs called *Maubain*, *Mombina*, or *Mommina*, and which, therefore, we might suppose to be a *Spondias*, although he is doubtful whether it be the *Hobos* or *Spondias Myrobalanus*; and he mentions it as different from the *Spondias Mombin* of Linnæus, of which he gives a figure in the *Phytographia* (*t.* 218. *f.* 3.). But in the *Mantissa* (156.) he considers his *Mombina* as the same with his *Mamee Indicæ Occid. Juglandis folio vinifera* (*Phyt. t.* 204. *f.* 2.), which, if the synonyma quoted are right, is a tree (*Mammea Americana*) having no sort of affinity with the *Spondias*; for it has simple leaves, while those of the *Spondias* are pinnated. The figure given by Plukenet is so imperfect that very little reliance can be placed on it; nor can I venture to affirm whether it represents the branch of a tree with simple leaves, or part of a compound leaf. The name *Juglandis folio*, however, clearly implies the latter, and it is probable that Plukenet's *Mombina* is therefore a *Spondias*, the more especially as he compares it to the *Cat Ambalam* (*Hort. Malab.* i. 93.), which escaped my notice when I treated of that plant (*Linn. Trans.* xiii. 532.). Plukenet also compares with his *Mombina* the *Courondi*, of which I am now treating; but this only shows his inaccuracy, the *Courondi* having simple leaves. We may, therefore, altogether reject Plukenet's comparison of the *Courondi* with his American plant as unsatisfactory.

M. Lamarck (*Enc. Méth.* ii. 160.) mentions this tree on the authority of Rheede, without being able to throw any light on its affinities, merely quoting a name given by Ray, and derived entirely, I suppose, from Rheede's account. M. Lamarck thinks it probable, that in the *Courondi* the germen is above the calyx; but of this I am doubtful, as in the drawing of the fruit there is not

represented the least vestige of a calyx towards the pedunculus. The leaves, being opposite, prevent me from considering it allied to the *Anavinga,* and on the whole it seems more nearly allied to the *Combretaceæ* than to any other order, unless M. Lamarck's conjecture of the germen being above is well founded, in which case it would approach nearer the *Laurinæ.*

Bengieri, seu Bengiri, *p.* 105. *tab.* 51.

Giri, corrupted from *Girimaso* of the Brahmans, would seem to be the generic name, and *Ben* to be a specific term. The Portuguese of Malabar have judged properly of its affinities, in classing it with the *Phyllanthus Emblica* (*Neli-ca*); for it evidently belongs to the order of *Euphorbiæ,* and possesses in an eminent degree the acrimony of this order, as expressed by the Portuguese and Dutch specific names. Few plants of the order, however, are less nearly allied to the *Bengiri* than the *Emblica*; nor is Commeline more fortunate than the vulgar Portuguese in classing it in the genus *Ricinus.* We may judge of the slow and gradual progress of improvement from these rude attempts at arrangement, by the name given to this plant by Plukenet (*Alm.* 320.), who calls it "*Ricinus Indicus Patsjoti Malabaricæ foliis, fructu majore rotundo hexagono, Nilicamaram* (*Emblica*) *æmulo.*"

No subsequent notice was taken of this plant, until I found it in Tripura, and sent it in 1797 to Dr. Roxburgh, who again transmitted it to Willdenow under the name of *Sapium Bengerium*; but Willdenow published it under the name of *Sapium indicum* (*Sp. Pl.* iv. 572.), adopted since by Roxburgh (*Hort. Beng.* 69.) and M. Poiret (*Enc. Méth. Suppl.* ii. 796.). I have found the tree very common in the Delta of the Ganges, and the Bengalese called it to me *Hurmayi*; but in the *Hortus Bengalensis* they are said to call it *Hoorooa,* I suppose a typographical error, the second *oo* having been printed in place of *m.* In 1801, I found it common in the woods of Malabar, specimens from which were given to Sir J. E. Smith under the name of *Sapium Hurmais*; others from Bengal, under the name adopted by Willdenow, have been placed in the library at the India House.

I have called it a *Sapium* in compliance with the systematic authors of the day, without taking into consideration the foundations on which this genus rests; for it is no doubt true, as M. Poiret justly remarks, that this genus

scarcely differs from the *Stillingia*; and there is also very little difference between it and *Excoecaria*, if with Willdenow we admit into the latter, species with male and female flowers on the same individual. I shall here annex a description.

Arbor inter minores ramis pendulis, teretibus, elevato-punctatis. *Folia* alterna, bifaria, lanceolata, serrata, acuta, glabra, venosa. *Petiolus* teres, canaliculatus, tenuis, brevissimus, nudus. *Stipulæ* geminæ, laterales, minimæ, marcescentes.

Masc. *Florum amentum* vel potius racemus laxus, erectus, terminalis, foliis longior, sessilis. *Flores* fœminei ad basin amenti masculini solitarii, pedunculati.

Masc. *Amentum* (*racemus*) laxe imbricatum squamis sparsis (bracteæ), 4- seu 5-floris, bilobis, lobis utrinque reniformibus. *Flores* pedicello proprio squamis longiore instructi. *Calyx* proprius cyathiformis, obsolete tridentatus. *Corolla* nulla. *Filamenta* tria brevissima, e basi calycis enata. *Antheræ* didymæ lobis globosis. *Pistillum* nullum.

Fœm. *Calyx* tripartitus, minimus, sæpe vix conspicuus. *Corolla* nulla. *Germen* magnum, ovatum, superum, obsolete trigonum. *Stylus* brevissimus. *Stigmata* tria subulata, longissima. *Capsula* drupacea, magnitudine Sclopeti orbiculata, depressa. *Cortex* crassus, durus, succo lacteo scatens. *Putamen* osseum, trilobum, sexsulcum, triloculare. *Semina* solitaria, oblonga.

ARIA BEPOU, *p.* 107. *tab.* 52.

Bepou is the generic name in the vulgar language of Malabar, and *Nimbou* in that used by the Brahmans. This is no doubt the same with *Nim*, used in both the Hindwi and Bengalese dialects, and with *Nimba* of the sacred tongue; and must not be confounded with *Nimbo* or *Limbo*, from whence is derived the English word *Lemon*, used for various *Aurantiæ*. The confounding of these two words seems to have been the source of the error in Bontius complained of by Commeline.

This tree having been early known to botanists,—on account, probably, of its medical qualities, much celebrated among the natives,—Commeline has given us the names by which it was early known; and it is to be regretted that the

Sanscrita name *Nimbo,* or *Nimba,* used by Acosta, by Garcias ab Horto, and by John Bauhin, was not retained by moderns; for the names *Azedarach* and *Azadirachta,* applied to this and another species of the same genus, are both corruptions of the same Persian words, signifying the *tree Aza,* the first corruption having been adopted by Dodonæus, and the latter by Breynius. The similarity of the foliage of this tree and that of the *Ash* is so striking, as to justify C. Bauhin in having described it *Fraxino similis*; and it is not impossible that *Aza* and *Ash* may be the same word.

Plukenet, from a very superficial resemblance of its fruit to an Olive, calls the tree *Olea Malabarica fraxineo folio e Maderaspatana* (*Alm.* 269.), and gives a figure (*Phyt. t.* 247. *f.* 1.) representing the leaves especially, so that it cannot be mistaken. This plant of Plukenet, with several of the synonyma belonging to it, by the elder Burman was referred to his *Azedarach fructu polypyreno* (*Thes. Zeyl.* 40.), instead of to his *Azedarach foliis falcato serratis* (*Thes. Zeyl.* 40. *t.* 15.), which he properly says is the *Aria Bepou.*

Linnæus, adhering to the resemblance between the *Aria Bepou* and the *Ash,* has given the Greek name of the latter tree to the new genus; and the *Aria Bepou* in the *Flora Zeylanica* (161.) is called *Melia foliis pinnatis.* The errors respecting the synonyma into which the elder Burman fell are here properly corrected; but I cannot think it justifiable to give the Greek name of a well know European plant to an exotic genus. In the *Species Plantarum* the name *Azadirachta* was applied to the *Aria Bepou* (*Burm. Fl. Ind.* 101.), concerning which I have already given my opinion; nor has any change in name or synonyma since taken place.

I shall here give an account of a tree nearly allied to the *Aria Bepou,* which I found in moist woods both in Carnata and in the lower parts of Nepal, so that it probably extends all over India. Specimens from the former, with a drawing, were given to Sir J. E. Smith, and specimens from the latter to the library at the India House. As I have not seen the fruit, I cannot positively say that it is a species of *Melia*; but I have called it *Melia integerrima,* and shall describe it as observed in the Western Ghats ascending from Cancana.

Arbuscula. *Folia* alterna, apices versus ramulorum conferta, pinnata. *Foliola*

cum impari quadrijuga, opposita, remota, petiolata, acuminata, integerrima, nitida, subcostata, venosa: lateralium latus anterius posteriore et longius et latius; terminale ellipticum. *Petiolus* communis pubescens, basi incrassato teres, mediocris, non stipulaceus. *Rachis* teres, ad foliola nodosus. *Petioli* partiales canaliculati, breves, utrinque articulati; terminali productiore.

Pedunculus communis axillaris, solitarius, longitudine folii patens, ima parte incrassata teres, apicem versus tetragonus, nudus. *Cyma* erecta, composita radiis quinque, quorum quatuor laterales ancipites, corymbiferi, brachiati; intermedius tetragonus, iterum radiis quatuor umbellatus, vel aliquando brachiato-corymbosus. *Flores* parvi, albi, odorati. *Bracteæ* squamiformes, fugaces, involucriformes.

Calyx minimus, patens, laciniis obtusis quinquefidus. *Petala* quinque linearia, concava, apice acuto incurvo patentia, unguibus calycis medio inserta. *Urceolus* hypogynus, petalis paulo brevior, cylindricus, decemfidus, laciniis incurvis, bicornibus. *Antheræ* decem inter urceoli cornua insidentes, ovatæ. *Germen* superum, depressum. *Stylus* brevis, incrassatus. *Stigma* truncatum.

In Nepalæ arbore pedunculi divisiones minus regulares, et potius ramis subumbellatis paniculatæ.

On the most careful examination I cannot discover any solid characters by which we can distinguish the *Melia Azederach* from the *M. sempervirens* of the *Hortus Bengalensis*, and therefore I have no doubt that Linnæus and Lamarck were quite right in considering them as mere varieties, although the latter is a native of India Proper, and the other seems to extend from Persia to China along the sides of the great ridge of Emodus. In their native countries both are equally trees of a moderate size. If the West India plant mentioned by Willdenow is different from the *M. sempervirens* of India, that is, from the *M. foliis duplicato-pinnatis, α.* of the *Flora Zeylanica*, I have not seen it; and the *M. Azedarach, β.* of the *Species Plantarum* should be excluded from the synonyma.

In Indiæ australioris planta, *sempervirens* dicta, foliola lucida, bullata; in Chinensi planta, *Azedarach* a Roxburghio dicta, foliola plana, non lucida.

Prioris insuper foliola breviora, profundius incisa; sed plus minus speciem non distinguit.

Kari Bepou, seu Bepu, *p.* 109. *tab.* 53.

By the vulgar of Malabar this is reckoned to belong to the same genus with the preceding; but the Brahmans, whether they call it *Karabou* or *Cari Beu*, think it different; for the *Melia* they call *Nimbou*, evidently derived from *Nimba* of the Sanscrita; so that the terminal *Bou* or *Beo* cannot be reckoned a generic name, as Rheede would seem to have thought.

Commeline appears to have entertained no doubt that this should be placed in the same genus *Nimbo* with the *Aria Bepou*; and from Plukenet (*Alm.* 269.) I learn that both he and Breynius were of the same opinion, the latter calling it an *Azadirachta*, while Plukenet called it *Olea Malabarica Nimbo dicta fructu rotundiore*, although it must be observed that its fruit has not even the slight resemblance to an *Olive* which the fruit of the *Aria Bepou* possesses, but is evidently a berry; and the filamenta being distinct, it cannot even belong to the order of *Meliæ*.

I find no notice of this plant in subsequent authors; but were it not that Rheede describes it as a lofty tree, I should have little hesitation in considering it as the *Bergera Kœnigii*, which in the Tamul language, a dialect of that spoken in Malabar, is called *Kari Vepa* (*Hort. Beng.* 32.), evidently the same name with *Kari Bepu*. At any rate, there can be no doubt of both plants belonging to the same genus, which differs in no respect from the *Murraya exotica*, that is, the *Camunium japonicum* of Rumphius (*Herb. Amb.* v. 29. *t.* 18. *f.* 2.); nor from the *Calchas paniculata*, that is, the *Camunium javanicum* of Rumphius (*Herb. Amb.* v. 27. *t.* 27.). As I consider it thus absolutely necessary to unite three Linnæan genera, I would propose that the name *Camunium*, given by Rumphius to two of the three, should [be restored. Leaving these two to be treated of in a Commentary on the *Herbarium Amboinense*, I shall here confine myself to give an account of the *Bergera Kœnigii*, and to point out in what respects the *Kari Bepou* differs. The plant, which I call *Bergera Kœnigii*, I was assured by Dr. Roxburgh was pointed out to him by Kœnig himself, and it agrees sufficiently with the character given by Willdenow; but if this author actually meant the *Papaja*

sylvestris of Rumphius, as I have said in a Commentary on the *Herbarium Amboinense* (i. 149. *t.* 53. *f.* 1.), his *Bergera Kœnigii* must be totally different, belonging to the order of *Araliæ*, while the *Kari Bepou* belongs to the *Aurantiæ*.

The *Bergera Kœnigii* of Roxburgh in the dialect of Bengal is called *Panær*, and is common in all the eastern parts of that country, as I have seen it both in Tripura and Kamrupa, on which account I shall call it *Camunium bengalense, foliolis serratis, caule frutescente.*

Caulis fruticosus, 3—5 pedes altus. *Ramuli* virides, teretes, glabri. *Folia* alterna, internodiis longiora, cum impari pinnata. *Foliola* utrinque 5—8 sparsa, petiolata, serrata, glabra, venosa, pellucido-punctata: *terminali* lanceolato-ovato; *lateralibus posterius* angustatis, semiovatis; *inferioribus* brevissimis, obtusis; *superioribus* elongatis, acuminatis. *Petiolus* communis non stipulaceus, brevissimus, basi incrassato teres, pubescens. *Rachis* teres. *Petioli* partiales brevissimi, supra plani.

Corymbus terminalis, foliis brevior, erectus, compositus e ramis subtrichotomis, pubescentibus. *Bracteæ* ad corymbi divisiones minutæ. *Flores* albi, odorati.

Calyx minimus, inferus, quinquedentatus. *Petala* quinque patentia. *Filamenta* decem receptaculo hypogyno plano mellifero inserta, subulata, erecta; quorum quinque petalis opposita breviora. *Antheræ* oblongæ, compressæ, obtusæ. *Germen* oblongum. *Stylus* crassus. *Stigma* subrotundum, umbilicatum.

Bacca supera, pulposa, nigra, ovalis, utrinque obtusa, compressiuscula, ante maturitatem coriacea, et punctis glandulosis aspersa, bilocularis, loculorum uno sæpius sterili, et in fructu maturo fere evanescente. *Funis* umbilicalis ex apice septi membranacei tenuis enatus, ad basin seminis descendens, ibique integumentum venosum dispersus. *Semen* hinc convexum, inde planum. *Integumentum* tenuissimum, membranaceum, embryoni laxe adhærens. *Embryo* forma seminis basin versus subito nonnihil attenuatus, viridis. *Cotyledones* carnosæ, glanduloso-punctatæ, apice transversim bifidæ; *interiore* plana, *exteriore* hinc convexa. *Radicula* teres, inversa, supera, inter cotyledones nidulans.

Now the *Kari Bepu* may be called *Camunium malabaricum, foliolis serratis, caule arboreo*; and from the following circumstances, mentioned by Rheede, may be considered as clearly different from the *Panœr* of Bengal: "*Arbor* præcelsa atque speciosa plurimum, caudice præcrasso. *Flores* graveolentes. *Fructus* rotundi (globosi.") I suspect that this may be the *Limonia arborea* of Dr. Roxburgh (*Hort. Beng*. 90.), which he found in the South of India, but never could procure for the garden at Calcutta. The chief doubt that may arise in considering the *Kari Bepou* as a *Camunium* is, that Rheede says, "Fructus *Aria Bepou* fructibus similes," which would imply its being a *Drupa*; but in the figure there is no confirmation of this, but a great resemblance to the berry of the *Camunium.*

While I have thus endeavoured to show that the *Bergera* of Kœnig belongs to a genus long before known, I must state, that the *Bergera* of Roxburgh contains a plant forming a very distinct genus from the *Bergera* of Kœnig, but still allied to the *Kari Bepou.* I am not, however, sure that it is sufficiently distinct as a genus from the *Ekebergia indica* of Roxburgh (*Hort. Beng*. 33.). This plant I sent to Dr. Roxburgh from Tripura in 1797; and I have since found it in and near several of the hilly regions bordering on the Gangetic plains. I have given specimens to the library at the India House, and I shall now describe it.

BERGERA INTEGERRIMA. *Hort. Beng*. 32.

Ban Kongeha in Tripura }
Bosomut in Matsia } *Bengalensium.*
Phriki in Camrupa }

Habitat in India Gangeticæ humidioris et Nepalæ dumetis.

Arbuscula ramulis teretibus, tomentosis. *Folia* alterna, cum impari pinnata. *Pinnæ* alternæ utrinque 3—6, pedicellatæ, integerrimæ, acuminatæ, costis supra depressis lineatæ, vix venosæ, punctatæ: *juniores* pilosæ, adultæ glabræ; *inferiores* breviores, ovatæ; *superiores* latere posteriore angustato semiovatæ; *terminalis* deltoideo-ovata. *Petiolus* non stipulaceus, basi incrassato teres, foliolo longior. *Rachis* teres, plerumque pubescens.

Panicula terminalis, erecta, folio multo brevior, multiflora, ramosissima,

corymboso-fastigiata. *Rami* teretes, pubescentes, sparsi. *Bracteæ* vix ullæ. *Flores* odore hircino gravissimo subherbacei, pedicellati, fasciculati.

Calyx minimus, inferus, quinquedentatus. *Petala* quinque lanceolata, revoluta, acuta, integra. *Filamenta* decem lanceolata, receptaculi basi inserta; quinque petalis opposita breviora. *Antheræ* orbiculatæ, compressæ. *Germen* oblongum, receptaculo conico suffultum. *Stylus* teres, crassus. *Stigma* magnum, orbiculatum, depressum.

Bacca ovata, aurea, punctis oleiferis aspersa, glabra, coriacea, quinquelocularis septis membranaceis e pariete ad receptaculum deductis. *Loculorum* 4—2 sæpe deficientes. *Receptaculum* centrale, tenue. *Semina* in singulis loculis solitaria, magnitudine et forma loculi oblonga, utrinque acuta, hinc convexa, inde angulata, angulo ad receptaculum adhærentia. *Integumentum* simplex, membranaceum, tenue, facile secedens. *Albumen* nullum. *Embryo* semini conformis, inversus, læte viridis. *Cotyledones* foliaceæ, altera minore subrotundæ, ad se invicem adhærentes, plicato-fasciculatæ. *Radicula* teres, viridis, supera, plicis cotyledonum tecta.

This singular structure of seed I have found in the *Libanus Thurifera* of Colebrooke, and in a species of *Schinus*, both plants belonging to the *Terebinthaceæ*, which shows how nearly these are connected with the *Aurantiæ*, as these are again allied by the *Bepou* with the *Meliæ*.

Kari Vetti, *p.* 111. *tab.* 54.

This and the following plant, which, as Commeline justly remarks, have no affinity either in appearance or qualities, are included in one genus, not only by the vulgar of Malabar, but by the Brahmans, the former calling the genus *Vetti*, and the latter *Daliqui*, or *Dalaqui*. Neither Dutch nor Portuguese residents have fallen into such a gross error, and I suspect some mistake in procuring the native names.

Commeline does not hint at any affinity to the *Kari Vetti*; but Plukenet compares it to his "*Olea laurino folio Portoricensis, summo margine crenato*" (*Alm.* 269.; *Phyt. t.* 206. *f.* 6.). As his figure has neither flower nor fruit, little can be said on this subject. The leaves have a resemblance; but there

is no reason to suppose that the plants are the same, although they may belong to one genus.

In the woods near Goyalpara I found a tree called there *Silapoma*, which I think may very possibly be the *Kari Vetti*; but as I did not see the flower, I am by no means certain. When I presented specimens to the library at the India House, I considered it as perhaps a *Myginda*; but now I think that both it and the *Kari Vetti* may be the *Olea dioica* of Dr. Roxburgh (*Fl. Ind.* i. 105.), although he says that in Silhet (*Srihata*) his tree is called *Atta Jam.* Such differences in vernacular names are, however, not uncommon even at less distances than between Goyalpara and Silhet. I shall here describe the *Sila Poma*, so far as I had an opportunity of observing it.

Arbor elata ligno utili. *Ramuli* nudi, punctis elevatis asperiusculi, compressiusculi. *Folia* subopposita, oblonga, basi acuta, apice acuminata, mucronato-serrata, rigida, subcostata, venosa, glabra. *Petiolus* brevissimus, glaber, supra concavus, non stipulaceus.

Paniculæ axillares, solitariæ, oppositæ, folio deficiente sæpe nudatæ. *Rami* subopposití. *Pedicelli* breves; laterales oppositi, terminales terni.

Drupa calyci minuto quadrifido insidens, magnitudine Pisi ovalis, acuta, carne tenui induta. *Nux* figura drupæ fragilis, unilocularis. *Semen* unicum, magnum. *Albumen* carnosum. *Embryo* rectus. *Radicula* teres. *Cotyledones* ovatæ, planæ, parallelæ.

The *Arbor vespertilionis* of Rumphius (*Herb. Amb.* vii. 17. *t.* 10.) and the *Parili* of Rheede (*Hort. Mal.* v. 5. *t.* 3.) have a great resemblance to this plant; but these I shall have further occasion to examine.

Pe seu Pee Vetti, *p.* 113. *tab.* 55.

This other *Vetti* was conjectured by Commeline to be the same with the *Solanum somniferum antiquorum ex Creta insula* of Prosper Alpinus. He indeed admits, " quod *Pevetti* in justæ magnitudinis excrescat arborem, at *Solanum somniferum antiquorum* humilis tantum sit arbuscula, seu potius frutex;" but he adds, " quod tamen pro loci natalis, aliorumque accidentium varietate contingere potest, uti in aliis stirpibus id observamus." The accuracy of such observations I in general very much doubt; and were there no

other reason, I should altogether reject, until demonstrated, the supposition of a tree found spontaneous in Malabar, being spontaneously produced in Crete under the form of a shrub.

Plukenet separates the *Pee Vetti* from the plant of Alpinus, but joins it with the *Solanum verticillatum* of J. Bauhin, and the *Solanum somniferum verticillatum* of C. Bauhin, and the *Solanum somniferum* of Parkinson, to which he annexes an American plant mentioned by Hernandez and Ray; and these now constitute the *Physalis somnifera,* said to be a native of Mexico, Crete, and Spain (*Willd. Sp. Pl.* i. 1020.), in which I suspect some mistake.

The elder Burman described a plant of Ceylon, which he called *Alkekengi somniferum Cydoniæ folio, flore et fructu rubris* (*Thes. Zeyl.* 10.). This, I think, I know well, and it is totally different from the *Pe Vetti,* which Burman enumerates among the synonyma, joining to it not only the synonyma given by Commeline, but those given by Plukenet; that is to say, he considers the *Solanum verticillatum* of Plukenet (*Alm.* 352.) as the same with the "*Solanum verticillatum virginiense latifolium molle, floribus obsolete rubris, baccis luteis*" of the same author (*l. c.*). It is probable that Burman was induced to do this by Plukenet's having included among the synonyma of both plants some that belonged to a plant of America, and some that belonged to the plant of Asia. The latter I know, and it is, no doubt, that found in Ceylon.

Linnæus in the *Flora Zeylanica* (96.) describes the plant of Ceylon under the name of "*Physalis caule fruticoso tereti, foliis ovatis integerrimis, floribus confertis,*" adding to it not only the *Pe Vetti,* but the plant of Southern Europe. He, however, quotes none of the American synonyma.

The younger Burman, however, copying probably the *Species Plantarum,* gives us the *Pee Vetti* and the shrubby plant of the *Thesaurus Zeylanicus* for the *Physalis flexuosa* (*Fl. Ind.* 54.), rejecting not only all the American synonyma, but those belonging to the plant of Southern Europe. Nor has any change been made since by Willdenow (*Sp. Pl.* i. 1020.). M. Lamarck, however, (*Enc. Méth.* ii. 100.) returned to the errors of the *Flora Zeylanica,* and makes the *Pee Vetti* not only the same with the *Physalis flexuosa,* but considers this as a mere variety of the *Physalis somnifera* of Europe.

In the *Hortus Kewensis* (i. 393.) the *Pe Vetti* continues to be quoted for the *Physalis flexuosa,* although there is not the smallest chance that the plant in

the noble collection of our King is anything but a shrubby *Physalis*, while the *Pee Vetti* "Arbor est justæ magnitudinis, caudice crasso—Flosculi (masculini nempe)—sex teretibus acuminatis—ac extrorsum reflexis foliolis constantes, medium occupante stylo exiguo (filamentum) candido, capitulo (anthera) flavo. —Baccæ plano-rotundæ (depressæ) acuminatæ, decem cingulis sulcatæ, purpuræ, glabræ, nitentes, intus in decem loculamenta per membranaceas quasdam pelliculas distincta, in quibus totidem locuntur acini—crocei—ita ut singuli in singulis latitent cellis." This account is totally irreconcileable with the *Pe Vetti* being a *Physalis*, and an inspection of the figure shows this still further. The separate figure of the fruit does not represent an inflated calyx concealing a berry, but a small calyx supporting the base of a large fruit. The flowers also are evidently monœcious; the male, described by Rheede, having an open calyx deeply divided into six segments, and containing in the centre one filament, which supports the antheræ united into a capitulum. The female flowers, not noticed in the letter-press, have the divisions of the calyx erect, and these include the germen crowned by a projecting sharp-pointed stylus. Whether the fruit is actually a berry, or is merely a coloured capsule, I cannot say. If it is a berry, this circumstance, and there being only one seed in each cell, may induce some to separate the plant from the genus *Bradleja*; although it is evident that the *Pe Vetti* has the utmost affinity to this genus, which includes most of the *Agynejas*. I suspect, however, that the fruit is merely a coloured capsule, which, with the red covering of the seeds, usual in the *Bradleja* ("semina arido-baccata," *Gærtn. De Sem.* ii. 127.), may have readily induced Rheede to use the term *bacca*, botanical language being then less definite than it now is. In this case, the circumstance of the seeds being solitary in the *Pee Vetti*, would be quite too trifling to distinguish it as a genus from *Agyneja multilocularis*, which is a *Bradleja*, of which I have given specimens to the library at the India House, or from the *Agyneja coccinea*, of which my account was published by Colonel Symes in the account of his Embassy to Ava, and of which specimens were sent to Sir Joseph Banks.

To the above-mentioned library I have given specimens of two plants, or perhaps of two varieties of one species, both of which agree so far with the character of the *Physalis flexuosa* that I have little doubt of its being one of them, although both entirely want the character (ramis flexuosis) from

whence the specific name is derived, and which seems to have been very remarkable in the specimens, from which Linnæus took his account, "ramis bifariam valde flexuosis." This character is not noticed in the *Flora Zeylanica*, although there can be no doubt that the same plant was meant. It is, however, retained in the *Hortus Kewensis*, where the plant is growing. This leads me to suppose that even in India there are several species of *Physalis* nearly allied to the *Solanum somniferum* of ancient botanists; and, in order to put a stop to any supposition of their being the *Pee Vetti*, I shall here describe those which I saw. Both varieties are called by the Bengalese *Sugunda*, and in the vulgar Hindwi dialect *Usgund*; but by writers on the *Materia Medica*, using a higher style, the name is written *Isganda*; and all these words are no doubt corruptions from *Aswagandha* of the Sanskrita. The plants grow in every part of India among impure rubbish near villages, such as that in which the *Hyoscyamus*, *Datura*, and other narcotic *Solanaceæ* delight, and probably possess analogous qualities. Their habit differs so much from that of the *Physalis* with esculent berries, that I doubt the propriety of including them in one genus.

The first variety or species which I shall mention I have called

Physalis Sugunda.

Radix forte perennis? *Caulis* lignosiusculus, erectus, duos vel tres pedes altus, ramosus, pubescens, teres, ramis rectis subdichotomus. *Folia* lanceolato-ovata, acuta, integerrima, costata, venosa, pubescentia; *inferiora* alterna; *superiora* sæpius geminata. *Petiolus* non stipulaceus, brevis, teres, supra planus, pubescens.

Pedunculi plures, axillares, conferti, uniflori, petiolo multo breviores, pubescentes, ebracteati. *Flores* parvi, absque macula in corollæ fundo herbacei, odore gravi pubescentes.

Calyx cylindricus, decemangularis, ore quinquefido, patulo. *Corollæ* calyce paulo longioris tubus incrassatus, brevis: *limbus* campanulatus, decemangularis, laciniis ovatis, patulis quinquefidus. *Filamenta* quinque e tubi parte inferiore enata, basi crasso subulata, longitudine corollam fere æquantia. *Antheræ* cordatæ. *Germen* superum, ovatum. *Stylus* teres, *Stigma* capitatum.

Calyx fructiferus maximus, inflatus, cordatus, acutangulus, ore clauso depressus. *Bacca* magnitudine Pisi subrotunda, glabra.

The kind which I found used by physicians is the same with what Dr. Roxburgh cultivated in the Botanical Garden as the *Physalis flexuosa,* although its branches are straight. It differs from the above description in the form of the calyx when the fruit is ripe, which in place of being depressed is shaped like an egg.

The plant of Ceylon, it must be observed, is described by Linnæus with a flexuose stem, and by Burman with red flowers, and is therefore probably different.

NOELI seu NULI TALI, *p.* 115. *tab.* 56.

The generic name *Tali* is applied by the Hindus to several plants. With the addition of *Tiru* prefixed it is given to some species of *Convolvulus* (*Hort. Mal.* xi. 109. 111.); but in this sense the compound *Tirutali* forms the generic name, and the different kinds are distinguished by additional specific appellations. In the South of India I found *Tali* used as the generic name for the *Bombax Gossypum,* which has no sort of affinity with the *Nuli Tali.* Even the *Nela Tali* of Rheede (*Hort. Mal.* ix. 31.), so like in name to the *Noeli Tali,* has no sort of affinity to this plant, for it is the *Æschynomene indica*: nor are the *Watta Tali* of Rheede (*Hort. Mal.* v. 63.) nor *Pi Tali* of the Bengalese any more allied to the *Noela Tali,* both probably being species of *Rottleria.*

Commeline had no doubt of the *Noeli Tali* being a *Berberis,* not less different from it than almost any of the above-mentioned plants. Plukenet, however, adopted the same arrangement, calling it *Berberis Indica Aurantiæ folio* (*Alm.* 67.); but the elder Burman, justly considering that the flowers of the *Noeli Tali* had no sort of resemblance to those of the *Berberis,* constituted a new genus for it, and called it *Antidesma,* adding the specific character "spicis geminis" (*Thes. Zeyl.* 22. *t.* 10.). Among the synonyma he added a plant of Jamaica, which probably may be safely rejected; nor am I entirely satisfied that his plant is the same with that of Rheede, for the figures differ a good deal in the form of leaf, and considerable reliance may be placed on the accuracy of both; besides, the specific character "spicis geminis" used by Burman is neither justified by the description nor figure in Rheede.

Linnæus in the *Flora Zeylanica* (357.), if I understand him rightly, was sensible of this difference, but unable to point out the characters by which the two plants could be distinguished. He therefore, under the head *Antidesma*, gives two sets of synonyma separated by a line. In this, perhaps, he intended to refer the synonyma to the male and female plants, according as each author represented one or other. This, however, is not certain; and I rather am inclined, as I have said, to attribute the separation to his having been aware of a specific difference or variety. In the first set of synonyma is placed the *Antidesma* of Burman, and in the second the *Noeli Tali*. The synonyma of this are not unexceptionable, nor free from typographical errors, which may mislead. First, the *Noeli Tali* is said to be in *Hort. Mal. p.* 19. in place of *p.* 115. Secondly, for the "*Arbor Indica, ovali folio, flosculis plurimis in spicis summo ramulo dispositis acinifera*" of Plukenet's *Mantissa*, we are referred to *t.* 329. in place of 339. This figure, although it evidently represents an *Antidesma*, refers, in my opinion, to a species different from the *Noeli Tali*, and seems to me to represent the *Mathasura* of the Hindwi dialect, which I take to be the *Antidesma pubescens*, β. of Willdenow, if that be different from the *Antidesma paniculata*. Thirdly, Linnæus quotes among the synonyma of the *Noeli Tali* the "*Planta folia habens oblongo-rotunda*" of the elder Burman (*Thes. Zeyl.* 194.) and Herman, which the former says is the *Keratya* of the Ceylonese; and from the term "folia oblongo-rotunda," I rather suspect that this belongs to the *Mathasura* rather than to the *Noeli Tali*; and I do so the more especially, because Linnæus alleges that the *Æmbilla* of the Ceylonese (*Herm. Zeyl.* 19. 26.) is the same with the *Noeli Tali*; but the *Æmbilla* of Herman is only quoted by Burman among the synonyma of "*Grossularia spinis vidua, baccis in racemo congestis, spadiceis, foliis crenatis, ovato-acuminatis*" (*Thes. Zeyl.* 112. *t.* 48.), which has no resemblance to an *Antidesma*; nor does he mention which of Herman's Æmbillas it is, although, from its having many stamina, it is, no doubt, the *Rhamnicastrum* of Linnæus (*Fl. Zeyl.* 410.), for which the latter, as well as for the *Antidesma*, quotes the *Æmbilla* 19. of Herman. We must therefore confine the *Noeli Tali* to the *Æmbilla* 26. of Herman, if Linnæus is right in quoting this, which I do not know. If he is right, then the *Noeli Tali* being the *Æmbilla* 26., and the *Antidesma* of Burman being the *Keratya* of the Ceylonese, the plants must be different. The

only synonyma, therefore, of the *Noeli Tali* given by Linnæus in the *Flora Zeylanica,* that can be admitted, are the *Æmbilla* 26., and the *Berberis Indica aurantii folio* of Commeline, Ray, and Plukenet. It must be further observed, that the *Antidesma* of Linnæus (*Fl. Zeyl.* 357.) has five stamina, and it therefore can neither be the *Noeli Tali* of Rheede nor the *Antidesma* of Burman, but is probably the *Arbor Indica, ovali folio, flosculis plurimis in spicis summo ramulo dispositis, acinifera* of Plukenet; and therefore I am still by no means certain that Burman was mistaken in considering his *Antidesma* and the *Noeli Tali* as the same.

Even after the publication of the *Species Plantarum,* matters were not improved in the *Flora Indica* of the younger Burman, for along with the pentandrous *Antidesma alexiteria* we have the triandrous *Noeli Tali* and *Antidesma* of Burman conjoined with the last-mentioned tree of Plukenet, which, having five stamina, is probably the plant really meant. Along with these, which probably form three distinct species, the younger Burman quotes the "*Berberi dumetorum, baccas similes ferens Arbor,*" Hermanni herb.; but I cannot trace any such plant in either the *Thesaurus* or *Flora Zeylanica*; nor do I know that any such now exists in Herman's collection. The younger Burman, mixing together the two sets of synonyma that are distinguished in the *Flora Zeylanica,* quotes also for the *Noeli Tali* the *Grossularia Zeylanica baccis minoribus acidiusculis* of his father (*Thes. Zeyl.* 112.). Here, like Linnæus, he leaves out the word *albis,* applied by the elder Burman to the berries of this plant: and we may safely reject this quotation; for Rheede says of the *Noeli Tali,* "Baccæ pulchre rubentes." The *A. alexiteria,* therefore, as it thus stands, comprehends four species, nor can I say which was really meant.

M. Lamarck takes his account of the *A. alexiteria* entirely from Rheede, quoting no other authority than the *Noeli Tali,* nor marking that he had ever seen the plant. He also considers the *Antidesma* of Burman as quite distinct, calling it *A. zeylanica.* The figure which he gives of the *A. alexiteria* (*Ill. Gen. t.* 812. *f.* 1.) is taken from Gærtner (*De Sem. t.* 39.), and is confined entirely to the fruit; but as Gærtner quotes both the *Noeli Tali* and the *Arbor Indica, ovali folio, flosculis plurimis in spicis summo ramulo dispositis, acinifera* of Plukenet, and as these plants are quite different, it would be difficult to say which he meant. I can only observe, that the fruit figured by

Gærtner has no great resemblance to that of the *Berberis,* while Rheede says, "*Baccæ* cylindraceæ—*Berberis* fructibus persimiles." We may therefore conclude that Gærtner has not delineated the fruit of the *Noeli Tali,* and that therefore his *A. alexiteria* is different from that of Lamarck, whose account is taken entirely from Rheede.

M. Lamarck thinks that Rheede described merely a female tree of the *Noeli Tali,* and, therefore, that the three stamina which he mentions are in reality styli. This would obviate one objection to the *Noeli Tali* being the *A. alexiteria*; but as several Antidesmas have three stamina, this remains very doubtful, especially as Burman in his *Antidesma,* so nearly allied to the *Noeli Tali,* describes the flowers, "stamina habentes tria calyce longiora, apicibus ex duobus veluti globulos compositis," which evidently alludes to real stamina, and not to styli, although he says, "post flores *Baccæ* sequuntur *Berberi dumetorum* similes," just as Rheede, after describing the stamina of his plant, says, "flosculis succedunt baccæ." Any one may indeed be satisfied that the figure of Burman represents a male, while that of Rheede represents a female; but then, in the two separate flowers which the latter gives, the three stamina with their antheræ are evidently delineated quite differently from the female flowers on the spikes. We may therefore, I think, conjecture, that the *A. alexiteria* of M. Lamarck is the *Noeli Tali,* and not that of Gærtner.

This unlucky plant has led Willdenow into worse mistakes than any yet mentioned, as he quotes it both for his *Stilago Bunius* (*Sp. Pl.* iv. 714.) and *Antidesma alexiteria* (*Sp. Pl.* iv. 762.). The genus *Stilago,* first founded by the younger Burman (*Fl. Ind.* 16.), and for which he quoted the *Bunius sativus* of Rumphius (*Herb. Amb.* iii. 204. *t.* 131.), has hermaphrodite flowers; and I know a plant that entirely agrees with the character which he gives; but this is totally different from that given by Willdenow from Schreber; and I know that Dr. Roxburgh considered his *Stilago Bunius* and *S. diandra* as not really distinct from the Antidesmas, as differing merely in the number of stamina; and M. Poiret is of a similar opinion (*Enc. Méth. Suppl.* i. 403.). The fruit in both is in fact a drupa. Whether or not Burman was right in quoting Rumphius for his *Stilago,* I shall not here inquire. It suffices to state here that the plant of Rumphius, having leaves agreeably acid, cannot be the *Noeli Tali,* of which the leaves are insipid. If, therefore, the *Bunius sativus* of

Rumphius is the *Stilago Bunius* of Willdenow, the *Noeli Tali* should be expunged from the synonyma, and we should refer it to his *Antidesma alexiteria*; but then that would not be the *Antidesma* of the *Flora Zeylanica*, which has five stamina; and as this also is quoted, it is impossible to say which Willdenow meant. If, indeed, it were certain that the author of the *Hortus Kewensis* was right in quoting the *Tsjeriam Cottam* (*Hort. Mal.* v. 21. *t.* 11.) for Willdenow's *Antidesma alexiteria*, then this could neither be the *Noeli Tali* nor the *Antidesma* of Linnæus; nor could it even belong to the same natural order, as its flowers have petals.

In the *Hortus Bengalensis* (71.) the *Noeli Tali* is quoted for the *Stilago Bunius*, and I think that I have seen the female plant on the lower hills of Nepal, where it is called *Patleya Archal*. This tree, however, cannot be the *Stilago Bunius* of Willdenow, if he meant either the *S. Bunius* of Burman or the *Bunius sativus* of Rumphius. It is, however, at least very nearly similar to the *Antidesma* of the elder Burman, and should be, therefore, the *A. zeylanica* of Willdenow (*Sp. Pl.* iv. 763.) and M. Lamarck (*Enc. Méth.* i. 207.). On this account, in the catalogue of dried plants given to the library at the India House, I have called the specimens *A. zeylanica*. Here I shall describe it.

Arbuscula ramulis pubescentibus. *Folia* alterna, oblonga, utrinque angustata, sed basi nonnunquam obtusa vel etiam emarginata, apicem versus nunc dilatata, tunc ibi quam prope basin angustiora, apice acuminata, margine subrevoluto integerrima, glabra, costis depressis undulata, venis raris reticulata, insipida. *Petiolus* brevissimus, compressus, canaliculatus, nudus. *Stipulæ* geminæ, persistentes, lineares, acutæ, petiolo longiores, incurvæ.

Racemi fœminei axillares vel terminales, simplices vel ramosi, folio sæpe longiores, erecti. *Pedicelli* solitarii, sparsi, uniflori, flore breviores, rigidi. *Bracteæ* ad singulos flores solitariæ, minutæ. *Flores* minuti, herbacei.

Calyx cyathiformis ore subquinquedentato. *Germen* calyce multo majus, anceps, ellipticum. *Stigmata* duo acuta.

Neque fructum, neque florem masculinum vidi.

Before leaving this subject, I shall give an account of the *Arbor Indica, ovali folio, flosculis plurimis in spicis summo ramulo dispositis, acinifera* of

Plukenet (*Mant.* 22. *t.* 339. *f.* 1.). This, as I have said, was quoted by Linnæus for the *Noeli Tali,* from which it differs in having five stamina. It is, therefore, probably the plant which Linnæus actually described in the *Flora Zeylanica* (357., *et Nov. Gen. ad calcem p.* 14.). This plant of Plukenet was entirely left out by M. Lamarck; but by M. Poiret it is considered as a variety (β.) of the *Antidesma pubescens* (*Enc. Méth. Suppl.* i. 402.), an opinion adopted by Willdenow (*Sp. Pl.* iv. 763.), although both quote Plukenet erroneously, the one quoting the *Phytographia,* and the other the *Amaltheum,* while the plant is actually described in the *Mantissa.* I doubt very much, however, whether the plant of Plukenet, which in the Hindwi dialect is called *Mathasura,* be sufficiently distinct from what I consider as the *A. paniculata* (*Willd. Sp. Pl.* iv. 764.; *Enc. Méth. Suppl.* i. 402.; *Hort. Kew.* v. 384.; *Hort. Beng.* 72.), the male of which by the Bengalese is called *Amri,* and the female *Abutenga.* Specimens of both the *Mathasura* and the *Amri* or *Abutenga* have been given to the library at the India House; and I shall here describe the latter, to show how well it agrees with the figure in Plukenet.

Arbuscula ramulis teretibus pubescentibus. *Folia* austera, alterna, ovalia, utrinque obtusa, basi aliquando retuso subcordata, integerrima, costata, venis reticulata, utrinque pubescentia. *Petiolus* brevissimus, pubescens. *Stipulæ* geminæ, laterales, caducæ, lineares, acutæ, petiolo longiores.

Flores diœci, herbacei. Masc. *Pedunculi communes* axillares vel terminales, solitarii, brevissimi, axillari sæpius bifido, terminali trifido. *Spicæ* filiformes, folio longiores. *Flores* sparsi.

Calyx minimus, hirsutus, 4—6-partitus. *Glandulæ* in calycis fundo laciniis numero æquales, hirsutæ, crassæ, minimæ. *Filamenta* totidem glandulis alterna, longissima. *Antheræ* bilobæ, apice dehiscentes. *Rudimentum germinis* in calycis fundo.

Fœm. *Racemi* axillares simplices, vel terminales ramosi, folio breviores, erecti, pubescentes. *Pedicelli* sparsi, solitarii, uniflori, brevissimi. *Bractea* ad pedicelli basin minuta.

Calyx concavus, ore obsolete quinquedentato minimus. *Germen* superum, ovatum, compressum. *Stylus* vix ullus. *Stigmata* (4—6) sæpius quinque, acuta, simplicia.

Drupa nigra, sicca, magnitudine grani Piperis, ovalis vel orbiculata, compressa.
Nux compressa, rugosa.

In the *Mathasura* the leaves have often a sharp point, as represented in Plukenet; but I see no other difference, and doubt of this being a circumstance sufficient to distinguish them as species.

Poutaletsje, *p.* 117. *tab.* 57.

Commeline considered this as a species of *Ligustrum.*

Plukenet compared to it a plant, which he called "*Poutaletsiæ Malabararum similis Arbuscula Maderaspatana*" (*Alm.* 305.; *Phyt. t.* 54. *f.* 1.), which seems to me very different even as to genus, the corolla in Plukenet's figure being divided into five.

The elder Burman proposed as a query, whether or not the *Poutaletsje* was the *Manithonda* of the Ceylonese, which he calls *Ligustrum indicum* s. *Alcanna* (*Thes. Zeyl.* 142.). This Linnæus in the *Flora Zeylanica* (135.) called *Lawsonia ramis inermibus,* concerning which error I had already had occasion fully to explain myself (*Linn. Trans.* xiii. 509.).

M. Poiret (*Enc. Méth. Suppl.* iii. 39.) having given up the *Poutaletsje* as a *Lawsonia,* has been obliged to return to the opinion of Jussieu (*Gen. Plant.* 222.), and adopts without reserve (*Enc. Méth. Suppl.* iv. 374. 546.) what the most distinguished botanist of France proposed merely as a query. He has not, however, given it a specific name nor character; and indeed seems to think that the genus *Petesia* (to which Jussieu referred it) should be altogether abandoned. With all due deference to the opinion of so great a botanist, I doubt of this plant belonging to the order of *Rubiaceæ.* I see no appearance whatever in the figure, nor the smallest hint in the description, of stipulæ; and if these are wanting, we may safely consider the *Poutaletsje* as a *Callicarpa.*

Modagam, *p.* 119. *tab.* 58.

This and the following belong to one Malabar genus, and have a considerable general resemblance; but, as Commeline remarks, they have no affinity in the view of European botanists. Both the vulgar and Brahmans consider this as the prototype of the genus, called by the latter *Corotha.* I cannot find this plant mentioned in any subsequent author. Rheede mentions a resem-

blance in its flower to that of the *Rhododendron,* and, in fact, I see nothing in the account of its fructification to oppose the opinion of its being an *Azalea*; and by the older botanists *Rhododendron* and *Azalea* were not distinguished. It must, however, be confessed that the general appearance of the *Modagam* is very different.

Bella, seu Bela Modagam, *p.* 121. *tab.* 59.

Plukenet was doubtful whether or not this, which Ray called a *Prunifera Indica,* was the *Takkada* of the Ceylonese (*Alm.* 361.); but the elder Burman had no doubt, and called the plant "*Arbor exitiosa, marina, lactescens, Indica, Takkada vocata, fructu Cerasi magnitudine, incarnato, striato*" (*Thes. Zeyl.* 29.). Burman further notices, in his observation on Rumphius (*Herb. Amb.* iv. 118.), that his *Takkada* cannot be considered as different from the *Buglossum litoreum* (*Herb. Amb.* iv. 116. *t.* 54.); but although Burman considered this as the same with the *Bella Modagam,* Rumphius only says that the two plants should be compared together, and justly adds, " Malabarica vero describitur esse montium incola, quum nostra planta nullibi nisi in litoribus obcurrat." Further, Rheede says of the *Bella Modagam,* "Arbor est speciosa et præcelsa plurimum;" while Rumphius says of the *Buglossum litoreum,* " hic frutex truncum gerit brevem, incurvum, vulgo pedem crassum."

In the *Flora Zeylanica* (313.) Linnæus mentioned a plant no doubt very nearly allied to the *Bella Modagam,* and which he called *Lobelia frutescens, foliis ovali-oblongis integerrimis,* and for which he quotes no Indian authority, except a drawing of Herman. This, no doubt, represented the plant that Linnæus then meant; and the term "frutescens," which he applies to it, would seem to exclude the *Bella Modagam.* Linnæus at the same time, however, quoted an American plant described by Plumier and Catesby, which is likely different from that drawn by Herman; although in the *Flora Indica* (186.) Burman calls the plant *Lobelia Plumieri,* as having been discovered by this botanist. It must be also remarked, that the younger Burman does not here quote the *Takkada* described by his father, although from the vicinity of Ceylon to Malabar, and from the similarity of their vegetable productions, it might be expected to be the same with the *Bella Modagam.*

It would appear that some time after this the plant of the *Flora Zeylanica*

was no longer considered by Linnæus as a *Lobelia,* but called *Scævola Lobelia*; for he transferred the name *Lobelia* of Plumier to the *Rapuntium* and *Trachelium* of Tournefort, with which he had originally confounded it; and thus, with his usual spirit of innovation, gave the name *Scævola* to the original *Lobelia.* There is also room to suspect that his *Scævola Lobelia* is neither the plant of Herman nor that described by Plumier; for Mr. R. Brown (*Fl. Nov. Holl.* i. 583.) assures us, that the *Scævola Lobelia* of the Linnæan Herbarium is the *Scævola Kœnigii* (foliis obovatis apice subrepandis), while the plant of Herman in the *Flora Zeylanica* is defined "foliis ovali-oblongis integerrimis," which terms are also applicable to the *Lobelia Plumieri,* to which we shall again have occasion to return.

Gærtner, adhering to the genus *Lobelia* as founded by Plumier, called the *Bella Modagam, Lobelia Taccada* (*De Sem.* i. 119. *t.* 25. *f.* 5.); but he considers the *Buglossum litoreum* as the same plant, and probably described it alone; for he says, that the figure of the drupa in the *Hortus Malabaricus* does not exactly agree; and he points out most essential differences in the American plant.

Dr. Roxburgh, under the name *Scævola Taccada* (*Hort. Beng.* 15.), I have no doubt described Gærtner's plant, and I have given to the library at the India House specimens from his garden; but the plant is not a tree, was sent from the Eastern Islands by Mr. W. Roxburgh, and agrees entirely with the description of the *Buglossum litoreum,* although the figure of the *Bella Modagam* is also very like, and is quoted by Dr. Roxburgh. This likeness, however, consists chiefly in the foliage, liable to considerable variation; and the size of the *Bella Modagam,* and its being a mountain plant, seem to me insuperable objections to our considering it as Dr. Roxburgh's *Scævola Taccada.*

M. Lamarck (*Ill. Gen.* ii. 70.) considers the American and an Indian plant different, calling the former (no doubt Plumier's *Lobelia*) *Scævola Plumieri* (*t.* 124. *f.* 1.), and the latter *Scævola Kœnigii* (*t.* 124. *f.* 2.), in imitation, probably, of Vahl; and this last is, no doubt, the same with the *S. Lobelia* of the Linnæan herbarium, as described by Mr. R. Brown. This Indian plant, M. Lamarck says, is the same with the *Lobelia Taccada* of Gærtner, from whom he no doubt has copied the delineations of the fruit marked *b, c, d, e, f, g, h,* and *i*; but then at *a* is represented the branch of a plant, agreeing with Mr. Brown's account, but quite different from either the *Buglossum litoreum*

or *Bella Modagam*, and therefore, probably, from the *Lobelia Taccada* of Gærtner, which, perhaps, is the *Takkada* of the elder Burman, and probably the plant figured by Herman (*Fl. Zeyl.* 313.).

Willdenow quotes no new authority for the *Scævola Kœnigii* but Vahl and Lamarck; and his *Scævola Lobelia* comprehends the *Lobelia* of the *Flora Zeylanica* (313.), the *Buglossum litoreum*, the *Takkada* of Ceylon, if that be different, and the American plant figured both by Plumier and Lamarck; nor is it possible to say which he meant. What is more to our present purpose, he leaves out the *Bella Modagam*, from which we may infer, that he considered it different from these above mentioned; and the same inference may be drawn from M. Poiret's silence (*Enc. Méth.* vii. 145.).

Finally, this latter botanist concluded (*Enc. Méth. Suppl.* v. 278.) that the *Scævola Lobelia* of Linnæus, meaning the *Lobelia* of Plumier, although nearly allied to the *Takkada* of Ceylon, is a different species; and that the *Takkada* of Ceylon is that of Gærtner, and is the same with the *Bella Modagam* and *Buglossum litoreum*. To the latter opinion I have no objection; but I have already stated reasons for thinking that the *Bella Modagam* is different. It would thus, I think, appear that we have at least three Indian Scævolas that have been confounded together, and continue to be so in the best authorities.

1. Takkada frutex Zeylonensium. *Pluk. Alm.* 321.
   Arbor exitiosa, marina, lactescens, Indica, Taccada vocata, fructu Cerasi magnitudine, incarnato, striato. *Burm. Thes. Zeyl.* 29.
   Buglossum litoreum. *Herb. Amb.* iv. 116. *t.* 54.
   Lobelia frutescens, foliis ovali-oblongis integerrimis. *Linn. Fl. Zeyl.* 313.
   Lobelia Plumieri. *Burm. Fl. Ind.* 186.
   Lobelia Taccada. *Gærtn. De Sem.* i. 119. *t.* 25. *f.* 5.
   Scævola Taccada. *Hort. Beng.* 13.

It is by no means yet certain that the *Buglossum litoreum* is exactly the same with the *Takkada* of Ceylon, although both are maritime plants.

2. Scævola Lobelia. *Linn. Herb.* ex auctoritate R. Brown.
   Scævola Kœnigii. *Lamarck, Ill. Gen.* ii. 70. *t.* 124. *f.* 2., *a.* *Brown, Prodr. Fl. Nov. Holl.* i. 583. *Willd. Sp. Pl.* i. 956.

3. *Bella Modagam,* remaining yet to be introduced into the modern system of botany.

TONDI TEREGAM, *p.* 123. *tab.* 60.

The plants composing the Malabar genus *Teregam* have no botanical affinity, three of them being *Fici* (*Hort. Mal.* iii. 79. 81. 83.), to which this has no resemblance in the eyes of a botanist; although the Brahmans also notice an affinity between it and the *Vatti* (*Ficus bengalensis,* Linn.), calling it by the generic name *Kara-vatti,* or Wild Banyan-tree.

Commeline abstains altogether from classing this *Teregam*; nor does M. Poiret venture a conjecture, although he describes the tree from Rheede (*Enc. Méth.* vii. 697.), and I find no other notice taken of it by modern botanists. In my opinion, it evidently appears to be of the same genus with the *Illa* of the Ceylonese, which is the original *Tomex* of Linnæus (*Fl. Zeyl.* 59.); for he says, "Tota structura fructificationis ad *Callicarpam* accedit, neque repugnat facies; sed petala quatuor distincta, filamenta receptaculo inserta, fructus cum in hac ignotus sit, conjungere genera non audeo." Now this agrees in every point with Rheede's account and figure, in which there is not only no appearance of a tube in the corolla, but the stamina are represented as remaining after the petala have fallen, which shows that they are inserted into the receptaculum. The species, it must be allowed, are abundantly distinct, the *Illa* having the leaves entire, while those of the *Tondi Teregam* are serrated. Linnæus, however, when he published the *Mantissa,* alleged that the *Illa* is a *Callicarpa,* having found a *Callicarpa,* which he took to be the same, and this is now generally called *Callicarpa lanata* (*Willd. Sp. Pl.* i. 620.; *Roxb. Fl. Ind.* i. 406); only the *Cornutia corymbosa* having been called by M. Lamarck (*Ill. Gen.* i. 293.) *Callicarpa lanata,* the *Illa* by M. Poiret has been called *Callicarpa Tomex* (*Enc. Méth. Suppl.* ii. 32.). Whether or not these changes, subsequent to the publication of the *Flora Zeylanica,* have been judicious, I cannot say. All the species of *Callicarpa* that I have seen have the corolla very decidedly monopetalous; while both Linnæus and Rheede, in describing the *Illa* and *Tondi Teregam,* agree in mentioning four petala. That the plant now called *Callicarpa lanata* has really a monopetalous corolla I know from Dr. Roxburgh's account, for he, describing from fresh specimens, may be safely trusted. He says, "tube of the corol bent to one side." This

irregularity in the corolla leads me to suspect that the *Callicarpa lanata* of Dr. Roxburgh is in fact the *Cornutia corymbosa* (*Enc. Méth.* i. 54.), afterwards called by M. Lamarck (*Ill. Gen. No.* 1500.) *Callicarpa lanata*; and that the *Callicarpa Tomex* of M. Poiret, who never saw the plant, is exactly the same. In this case M. Lamarck is probably right in quoting the *Tomex* of the *Flora Zeylanica* with doubt; and I suspect that the plant described by Linnæus in the *Mantissa*, by Vahl, by Gærtner, and by Roxburgh, is not the *Illa*, or original *Tomex*. Until, however, the fruit of this or of the *Tondi Teregam* is known, we had better adopt the original caution of Linnæus, "conjungere genera non audeo."

RAMENA PU, seu POU MARAM, *p.* 125. *tab.* 61.

I find no notice taken of this tree by any botanist, until Dr. Roxburgh received from Malabar a tree, which he took to be the same, and called it *Sterculia guttata* (*Hort. Beng.* 50.). It seems to differ very little, if anything, from the *Clompanus minor* of Rumphius (*Herb. Amb.* iii. 169. *t.* 107.), usually quoted for the *Sterculia Balanghas* (*Willd. Sp. Pl.* ii. 872.), for which, as I have said (*Linn. Trans.* xiii. 530.), the *Cavalam* of Rheede is usually quoted; but M. Poiret quotes both with doubt (*Enc. Méth.* vii. 429.). For this he assigns no reason, nor has he seen the plant; while Dr. Roxburgh considered the *Cavalam* as his *S. Balanghas* (*Hort. Beng.* 50.).

From the account given by the natives to Rheede concerning the fruit of the *Ramena Pu Maram* (testantur tamen Malabarenses nonnunquam baccas ferre hanc arborem oblongo-rotundas, flavo-purpurascentes), we may perhaps be induced to think that its fruit is small, and contains only a few seeds; in which case it is not likely to be the *Clompanus minor*, the fruit of which could never have been mistaken for a berry: but the case may be different with that of the *Sterculia guttata*; for although I did not see the fruit, I consider it as the "*S. macrophylla* capsulis dispermibus" (*Enc. Méth.* viii. 432.). I however have given specimens to the library at the India House of both the *S. Balanghas* and *S. guttata* of Dr. Roxburgh, with which the learned may satisfy themselves concerning the proper synonyma.

XII. *Memoir on the Degree of Selection exercised by Plants, with regard to the Earthy Constituents presented to their Absorbing Surfaces.* By CHARLES DAUBENY, *M.D., F.R.S. L.S. G.S., &c., Professor of Botany and Chemistry in the University of Oxford.*

Read November 19th, and December 3rd, 1833.

AMONGST the subjects recommended for consideration by the Chemical Sub-committee of the British Association for the Advancement of Science, during their Meeting at York in 1831, was that of the sources from which organic bodies derive their fixed principles; and as it was known to some of my friends that I had been engaged in certain inquiries that bore upon this subject, a request that I would undertake the investigation was accordingly entered upon the Minutes. I obtained, therefore, from this circumstance an additional motive for endeavouring, so far as my opportunities allowed, to prosecute the train of experiments which I had begun; and if I should scarcely yet have succeeded in determining to my entire satisfaction, whether or no there be any foundation for the idea sometimes entertained, that the earthy and alkaline principles which organized and living bodies contain are in any case elaborated by themselves, the reason must be sought for rather in the intricacy of the subject than in any want of disposition on my part to carry on an inquiry so recommended.

Incidentally, however, the results of my researches seem to lead to the establishment of a fact, which, as it serves to modify one of the conclusions deduced by the younger Saussure from his experiments on vegetation*, deserves, perhaps, a brief notice; and it is on this account, rather than for the sake of any new light I may have been able to throw upon the principal point in question, that I am desirous of laying before the Society the following details.

In the experiments that were made by Braconnot†, Schrader‡, and others,

* *Recherches Chimiques sur la Végétation*, 1804.

† *Annales de Chimie*, vol. lxi. p. 137.

‡ Gehlen's Journal, vol. v. p. 255.

with a similar intent to my own, the plants operated upon, in order that all external sources for the supply of earthy matter might be cut off, were made to vegetate either in washed sand, in sulphur, in pounded glass, in small shot, or in certain metallic oxides.

It occurred to me, however, that without placing them under circumstances so unnatural, and consequently so unfavourable to growth, the same end would be fulfilled if the seeds were sown in some earth which, though foreign to their constitution, agreed, nevertheless, more nearly in mechanical properties with those contained in the soils in which they were wont to grow.

It was with this intent that I was originally led to select as a soil for my plants the sulphate of strontian, which is obtained in abundance near Bristol, reduced to fine powder: and having found that the ashes of plants which had been reared in this matrix seemed to contain no trace of the earth, I was led, in the next place, to try whether this might be owing merely to the insolubility of the substance in question; for which reason I varied the experiment by watering my plants with a weak solution of nitrate of strontian.

It will appear from the subsequent details, that in either form of the experiment lime, and not strontites, was the earth that presented itself; but as in proportion to the care that had been taken to exclude any external source of supply for earthy matter, the quantity obtained from the ashes grew less and less, it would be rash to infer, from the small excess of lime which was detected, any power belonging to the plant of forming it, when not supplied from without.

Should it, however, appear that a vegetable, which, though not perhaps in full vigour, was at least in a growing and healthy condition, remained in contact with strontian, both in the state of sulphate, and likewise in that of nitrate dissolved in water, for months together without absorbing any portion, and that, although in want of earthy matter, as its laxity of fibre evidently betrayed, the conclusion would seem to follow, that plants have to a certain extent the power, as living agents, of rejecting such substances as, without being poisonous, are unusual to them, and probably unfitted for their œconomy and structure.

Omitting some previous experiments, of which I have preserved no correct

notes, I will in the first instance refer to one made in 1827, in which grasses and trefoils of various kinds, which had been watered from time to time with a solution of nitrate of strontian, were found on examination to possess no trace of this earth*.

In the above instance, however, as the plants had grown in common garden mould, all that could be inferred was, that when lime and strontian are both presented in a state of solution to their roots, they select the former, and reject the latter.

In 1829, the seeds of various plants, such as the garden radish (*Raphanus sativus*), the cabbage (*Brassica oleracea*), the garden bean (*Vicia Faba*), hemp (*Cannabis sativa*), &c., were sown in soils containing various proportions of sulphate of strontian, with or without manure, and amongst the rest, one in which no other ingredient, except this earth, was present in any quantity. The plants grew up, and when they had arrived at maturity, were collected, burnt, and their ashes examined. No strontian, however, could be detected in any one of them, not even in that where the matrix consisted almost wholly of the earth in question.

In 1831, the experiments were conducted with rather more attention to

* I will state, for the satisfaction of chemists, the method I pursued to determine whether strontian was or was not present.

After washing off the alkaline salts from the ashes by lixiviation in warm distilled water, I digested the residuum in diluted nitric acid. This first acted upon the earthy carbonate, and afterwards upon the earthy phosphate. The solution in nitric acid consequently contained both. The phosphate being thrown down by ammonia, the nitrate remaining in solution, rendered exactly neutral, was evaporated by a heat never exceeding 212°, in a flask, and when dried, the mouth of the vessel was closely stopped by a cork. When cold, alcohol of the sp. gr. of ·815 was poured upon it, which would dissolve all the nitrate of lime. If there was no undissolved residuum, the absence of strontian from this portion of the ashes might be fairly inferred. If there was any, I generally digested it with a solution of carbonate of soda, and after filtering, heated the earthy residuum in a covered capsule, so as to expel the carbonic acid. A small quantity of distilled water would then generally dissolve the whole; and if the addition of a drop or two of sulphuric acid to this solution did not render it turbid, I felt myself justified in concluding that no strontian was present. The precipitate, if any, was concluded to be sulphate of strontian.

A similar procedure was adopted with reference to the earthy phosphate, and likewise to that portion of the ashes which remained undissolved by the nitric acid upon its first application. In both cases, digestion with an alkaline carbonate reduced the earthy matter to a fit condition to be acted upon by nitric acid, and the subsequent steps pursued to determine the presence of strontian in it corresponded with those already detailed.

accuracy. 1124 grains of scarlet kidney-beans (*Phaseolus multiflorus*) were sown in a box containing about 290 lbs. of powdered sulphate of strontian, which had been ascertained to be free from alkaline matter, but to contain 2 per cent. of carbonate of lime, and about ½ per cent. of alumina. The box was placed in an open situation, exposed to sun and rain; and when the plants reared from these seeds had come to maturity, they were cut down and burnt. An account was then taken of the weight of the ashes remaining after the combustion had been completed, and of the fixed principles obtained from them, first, by lixiviation in water; secondly, by digestion in nitric acid; and thirdly, by treating the remainder with an alkaline carbonate, and then, again, with the same acid as before. A similar process was gone through with the same quantity of the kidney-beans as that of which the plants examined had been the produce.

The following will present a tabular view of the results obtained.

Subject of the Experiment.	Where sown.	Weight of its ashes.	Soluble portion of these ashes			
			In water.	In nitric acid,		
				Without previous treatment.	After having been acted upon by an alkaline carbonate.	
					Earthy phosphate.	Earthy sulphate.
Seeds of *Phaseolus multiflorus*, 1124 grs.	....	106	6·7	0·67	0	0
Ditto, 1124 grs.	In a soil chiefly composed of sulphate of strontian, in a garden ...	283	11·3	131·5	31·0	2·3

Now the aqueous solution represents the amount of alkali combined either with the phosphoric or carbonic acids; the solution in nitric acid without previous treatment, the earthy carbonates and phosphates*; that in nitric acid, after the action of an alkaline carbonate, the earthy sulphate, with that por-

* The difference in the quantity of lime to be inferred from 100 of phosphate and 100 of carbonate was only as 53 to 56.

tion of the phosphate which had escaped the previous action of the acid. These were not distinguished with any precision one from the other, because my object was merely to show that a large increase in earthy matter had resulted from the process of vegetation; but the several portions were all minutely examined for strontian, of which they furnished no trace.

The same year I endeavoured to ascertain how much of this increase might be attributable to the rain, and the matters brought with it, by the following experiment:

I procured six oblong boxes, of nearly equal size, coated internally with sheet zinc, two of which were filled with sulphate of strontian, two with powdered Carrara marble, and two with sea-sand, well washed both with water and muriatic acid. Of these, one of each kind was placed in a greenhouse, where they were protected from dust and rain; and the same number in an open garden, where they were exposed to both*. There was also placed in the garden a fourth box, of twice the dimensions, filled only with common mould. In each of the six smaller boxes were sown 780 grains of the seeds of the winged-pea trefoil (*Lotus tetragonolobus*), in the largest one double that quantity; and when the plants had severally grown up in their respective situations, they were cut down, dried, reduced to ashes, and examined, a comparative analysis being at the same time made of a quantity of the seeds equal to that planted in each of the six smaller boxes.

It will be seen from the following tabular view of the results obtained, that in every one of these cases there was an excess of earthy salt beyond that existing in the seeds, and in one case an excess of alkaline; those even which had vegetated in a soil chiefly consisting of sulphate of strontian obtaining, nevertheless, an increase of earthy matter, and this containing not even a trace of strontites, but consisting wholly of lime. In other respects the quantity of earth obtained appeared to keep pace with that in which the plant was supplied with it from without. Thus, the largest amount of lime was from the plants that had grown in Carrara marble, and of silex from those that had grown in sand. On the other hand, the great increase of calcareous salts in the produce of the seeds that had grown up in the garden, in a soil consisting of sul-

* I am indebted to Professor Buckland for the use of a garden, in which the boxes were placed during the time the experiment lasted.

phate of strontian, indicates how much is owing to the quantity of earthy matter brought to it by the rains.

The following is a tabular view of the results of the above-mentioned experiments.

Subject of the Experiment.	Where sown.	Weight of the plant when dried.	Weight of its ashes when burnt.	Portion soluble In water, Consisting of Potass combined with carbonic and phosphoric acids.	Portion soluble In nitric acid, Consisting of Same combined with carbonic and phosphoric acids.	Portion insoluble in these menstrua. Chiefly siliceous.
Lotus tetragonolobus, seeds 780 grs.	....	....	30	5·2	3·4	only a trace.
Same quantity of ditto.	*In a Greenhouse.*					
	Soil. Sulphate of strontian.	4002	60	very small.	17·15	not estimated.
Ditto.	Carrara marble.	2233	67·5	1·8	20·9	not estimated.
Ditto.	Sea-sand.	1135	34·3	4·1	6·0	not estimated.
Ditto.	*In a Garden.*					
	Soil. Sulphate of strontian.	4862	94·0	0·72	27·2	not estimated.
Ditto.	Carrara marble.	3267	64·5	a trace.	28·2	1·5
Ditto.	Sea-sand.	2957	67·0	a trace.	16·0	8·8
1560 grs. of Ditto.	Common garden mould ..	10534	164·50	33·6	27·70	10·0
or 780 grs.	In ditto.	5267	82·25	16·8	13·85	5·0

In 1832 I made similar arrangements to those just alluded to, with the addition of a fourth box, containing washed flowers of sulphur, and the omission of those which the preceding year had remained in a garden. The four boxes employed being placed in a greenhouse under cover, 300 grains of barley were sown in each of them, and they were severally moistened, as they seemed to require, with distilled water, containing in every ten gallons two

ounces of nitrate of strontian. The plants were treated in the same manner as on the preceding year, though, it is to be remarked, they did not thrive equally well. They were not cut down until the whole of the water had been expended upon them; so that we may calculate about half an ounce of nitrate of strontian to have been applied to the roots of each.

The following is a tabular view of the results obtained.

Subject of the Experiment.	Where planted.	Weight of the dried plant.	Weight of its ashes.	Soluble portion of these ashes: In water.	In nitric acid, Without previous treatment.	In nitric acid, After being acted on by an alkaline carbonate. Earthy phosphate.	In nitric acid, After being acted on by an alkaline carbonate. Earthy sulphate.	Portion insoluble in these menstrua.
Barley (*Hordeum vulgare*), 300 grs. ...	....	....	7·7	1·53	1·68 N.B. Consisting entirely of phosphate.	......	·45	2·04
	In a Greenhouse. SOIL.							
300 grs. of ditto.	Sulphate of strontian.	383	61	13·3	17·0*	3·6	1·3	0·9
Ditto.	Carrara marble.	230	34	7·8	14·5	......	2·5	0·8
Ditto.	Washed sea-sand.	260	45	10·5	5·9	0·9	2·5	2·1
Ditto.	Flowers of sulphur.	78	7	0·9	4·0	none.	none.	0·1

At the same time at which the above four samples had been planted, 100 grains of barley were sown in flowers of sulphur, and moistened only with distilled water. This latter yielded only 16 grains of the dried barley-straw, and being burnt, left no more than 1 grain of ashes,—a quantity so much less than what would have proceeded from the 100 grains of barley, of which it was the produce, that I thought it useless to carry the examination of them any further†.

* These salts for the most part consisted of nitrates of lime derived from the action of nitric acid upon the earthy carbonate, of which the greater part consisted.

† M. Laissaigne, as quoted by M. Richard, made an experiment to the same effect and with similar results to this of mine. But his mode of conducting it appears in this respect unsatisfactory, in as much

I may remark, that all the four samples of barley-straw, which had been watered with the strontian solution, were examined with care in the hope of detecting in them the presence of that earth; but the earthy matter obtained from those planted in sea-sand and in sulphur presented not even a trace of it, that from sulphate of strontian only 0·3 of a grain, that from Carrara marble only 0·4,—an amount beyond comparison smaller than what would have been present had it been secreted with the same readiness as a calcareous salt would have been. Yet that the presence of nitrate of strontian did in some measure contribute to the growth of the plant may be inferred by comparing the amount of barley-straw obtained from the flowers of sulphur watered with that solution, and that from the same matrix moistened merely with distilled water.

In the first case, the barley-straw weighed 78 grains, and the ashes derived from it 7; whilst in the second, that from an equal amount would have yielded 48 grains, and its ashes only 3 grains.

The same year a similar train of experiment was pursued with the *Lotus tetragonolobus*, or Winged Pea Trefoil.

Six hundred grains of the seeds of this plant were sown in each of the boxes employed in the foregoing experiments. They were moistened from time to time, as before, with water containing two ounces of nitrate of strontian to the ten gallons, and they were not cut down until the whole of this water had been expended upon them.

In order the better to arrive at an approximation to the actual increase of solid matter obtained during the process of their vegetation, the plants were taken up by their roots, and the adhering earthy matter carefully detached; but lest this should have been incompletely effected, the stems and other parts

as the plant was taken up before it could be expected, in the natural course of things, to have begun to draw upon external sources for a supply of earthy matter. It is well known that the albumen of the seed is expressly provided for the nutriment of the infant plant; hence, the first effort of germination is to produce nothing more than an evolution of matter previously existing in the seed, and it is only in the future progress of the plant towards maturity, after this internal supply has been exhausted, that we can hope to trace, if at all, any increase of earthy or alkaline matter. Now M. Laissaigne's experiment was stopped at the end of fifteen days, a period too short to allow of much accession of earthy matter from without to have taken place.—See Richard's Elements of Botany, English Translation by Dr. Clinton, p. 213.

of the plant which had been above the surface of the soil were separated, so that these at least might be considered free from any ingredients, except such as constituted integrant parts of its actual composition.

The several portions of these respective samples having been weighed, reduced to ashes, and examined in the usual way, the results were obtained indicated in the following Table, in which the stem, leaves, and flowers are comprehended under the head of "Parts above ground"; the roots and seeds which had not germinated, under the head of those "under ground".

Subject of the Experiment.	Where sown.	Weight of the dried plant.	Weight of its ashes.	Portion soluble in water.	Portion soluble in nitric acid.
Seeds of the *Lotus tetragonolobus*, 600 grs. . .	....	....	23	4·0	2·6
	In a Greenhouse.	*Parts.*			
	Soil.	Gr.			
Ditto. Same quantity.	Sulphate of strontian.	above ground . . . 170	22	6·65	2·65
		under ground . . . 107	40	0·48	5·60
		277	62	7·13	8·25
Ditto.	Carrara marble.	above ground . . . 150	19	3·70	16·3
		under ground . . . 152	34	3·20	37·0
		302	53	6·90	53·3
Ditto.	Washed sea-sand.	above ground . . . 34	5	2·3	1·4
		under ground . . . 100	6	1·4	1·7
		134	11	3·7	3·1
Ditto.	Flowers of sulphur.	above ground . . . 100	6	2·6	2·9
		under ground . . . 108	5	2·6	1·9
		208	11	5·2	4·8

The aqueous solution consisted chiefly of potass combined with the carbonic or phosphoric acids, together with a slight admixture of sulphate of lime, whilst the portion which the acid dissolved was chiefly composed of an earthy carbonate and phosphate.

Now I satisfied myself, by a minute examination, that the acid solution derived from the stems contained no trace whatever of strontian, although a small portion appeared to be present in, or at least adherent to, the roots.

In other respects the results indicate decisively a connexion between the quantity of earthy matter contained in the plant, and the readiness with which it is supplied with it from without; since, even if we confine ourselves to the portions above ground, where there can be no suspicion of any foreign admixture, it will be seen that the largest amount of calcareous earth was obtained from the straw which had grown up in Carrara marble, and that the excess of it over that in the seeds was in the other instances but inconsiderable.

The last experiment of the kind I shall allude to was made in the present year.

Two boxes only were this time employed, the one filled with sea-sand, the other with Carrara marble. In each of them 500 grains of barley were planted; they were watered, as before, with a weak solution of nitrate of strontian, and were protected from dust and rain by being placed under cover in a greenhouse. The plants obtained, being burnt, were treated in the same manner as before, and rigorously examined for strontian. Of this, the roots of both samples appeared to contain a trace, though the largest amount did not exceed $\frac{1}{10}$th of a grain. On the other hand, the parts which were above the surface, and therefore free from all contact with the soil, appeared to be entirely destitute of this earth. Nevertheless every portion, both of the sand and of the Carrara marble, was found impregnated with the nitrate of strontian that had been held in solution by the water with which the plants had been moistened.

I fear the conclusions that may be legitimately deduced from the above experiments will hardly be deemed of sufficient novelty and importance to repay the labour and time they have cost me; since, in so far as the main point is concerned, they serve only to confirm in an indirect manner the conclusion, which both analogy and experiment concur in establishing, namely, that if plants do in some cases obtain fixed principles which cannot be traced to any external source, yet the quantity of such substances which enters into their system is always less in proportion to the pains taken to cut off a supply. Hence the inference would seem to be, that the indications of a contrary description that sometimes present themselves are fallacious, resulting from the

many imperceptible channels by which earthy and alkaline matter may obtain admission to the juices of a plant*.

Had I not very early in the course of these experiments been led to despair of excluding the minute but continual supplies, which are probably brought by the very air and water which come into contact with the absorbing surfaces of every vegetable, especially in the centre of a large town, I should not have remained satisfied without purifying the sulphate of strontian in which the seeds were sown from the other earths with which I found it to be mixed. But the labour of getting rid of these ingredients seemed to be uncalled for with reference to the objects to which I found it necessary to confine my inquiries; since even had I employed the earth in a state of perfect purity, and detected an excess of lime in the plants reared in it beyond that contained in their seeds, still I should not have been justified in inferring the actual generation of earthy matter, any more than I have felt myself to be from the similar result I obtained when flowers of sulphur were the matrix in which the plants had vegetated.

The faculty, however, possessed by them of rejecting strontian, even when presented to the absorbing surfaces of their roots in a state of solution, would seem sufficiently substantiated; and an analogous circumstance may be cited in the animal kingdom, if I can rely upon an experiment which I made several years ago, that of confining some hens of the Guinea-fowl during the breeding-season in a place where they could obtain no other earth, except some powdered sulphate of strontian, which they appeared to devour greedily.

Yet only a minute trace of this earth was discoverable in the shells of their eggs, of which those laid during the first part of their confinement retained their natural hardness, but those of later production were as soft as if the birds had been entirely debarred from every kind of earthy matter.

It may be asked, whether the strontian is taken first into the system, and afterwards excreted from it, or whether the spongioles of the roots refuse it

* The case which I should be most disposed to bring forwards in support of the contrary opinion is that of the phosphoric acid, which forms so abundant an ingredient in all animal structures. Is its quantity sufficiently accounted for by that introduced into the system by the food taken in? On this subject I hope at some future time to complete some experiments. See also Dr. Prout's Paper on the phosphate of lime existing in the young chick before the egg is hatched.

admission. The latter supposition seems the more probable one, since, if we adopt the former, we ought to be able always to find traces of the earth diffused throughout the vegetable tissue; and I may relate an experiment of my own, which seems to confirm it, undertaken after the plan of those by means of which the ingenious M. Macaire of Geneva established his important doctrine with respect to the excretory function discharged by the roots of plants.

A small *Pelargonium* was taken out of its pot, and its roots divided into two nearly equal bundles, one of which had its extremities immersed in a glass containing a weak solution of nitrate of strontian; the other, in one containing pure distilled water.

After a week had elapsed, the water contained in the second glass was tested; but no strontian could be discovered in it, though a single grain in one pint of water would have been readily detected by my method. Hence it would seem that the strontian is not excreted by the roots.

Yet this power of rejecting the earth in question, if possessed by the plant, must be held compatible with that of absorbing the water containing it, with which its roots are in contact. I took out of the ground a small Lilac (*Syringa vulgaris*), and introduced its roots into a glass globe containing seven pints of a weak solution of nitrate of strontian. In about a fortnight the quantity was reduced to three pints, the remainder having for the most part been absorbed by the roots; for evaporation was prevented by covering the surface of the water with a stratum of olive oil, and the mouth of the vessel with a cork. Unluckily, the original quantity of salt had not been estimated; but it was found that what remained in the water at the close of the experiment yielded 69·4 grains of sulphate of strontian, equivalent to 39·2 of the earth. The four pints of water therefore consumed, if they had passed through the organs of the vegetable charged with their original quantity of nitrate of strontian, would have carried into its circulation 22·4 grains of this earth; and as the water was absorbed at the average rate of about $4\frac{1}{2}$ ounces per diem, it follows that more than a grain and a half would have been carried daily through the substance of the plant, supposing the salt to have been taken up in the same ratio as the water. Now on burning the plant, and examining its ashes, a trace of strontian certainly was detected, but its whole amount did not reach

the $\frac{1}{5}$th of a grain, that is, 2 per cent. of the whole quantity of earthy matter present, my analysis indicating

	Gr.
Of lime	7·30
— strontian	0·18
Total quantity of earth	7·48

The conclusion to which I have been led by the foregoing experiments may appear at first sight inconsistent with those deduced by M. de Saussure in his elaborate work on vegetation before referred to, in which he has shown that some poisonous substances, such, for example, as salts of copper, are freely absorbed by the roots of vegetables, and retained in considerable quantities in their tissue.

But it will be recollected, that this philosopher himself accounts for the circumstance by the disorganization which such bodies, by their presence, occasion in the fibres of the roots.

I have myself found that when a *Pelargonium* had a portion of its roots immersed in a solution of bichromate of potass, a trace of this salt was conveyed into a second glass containing distilled water, which had no connexion with the former, except through the medium of a parcel of the roots which dipped into it. Nor was this owing to capillary attraction, for the same effect did not take place in another experiment, in which the roots were detached from the body of the plant, and therefore acted as dead matter; and, moreover, the salt was detected by appropriate tests applied to the stems and leaves.

In this instance, then, the substance was seen to circulate through the whole texture of the vegetable, and ultimately to be excreted by its roots; and a similar result was obtained in the case of another plant, in which a solution of proto-sulphate of iron had been dissolved in the water in contact with its extremities*.

* That is to say, the salt was detected by ferro-cyanate of potass in many parts of the stem and branches; but it did not reach above a certain point, nor was it excreted by the roots, this difference arising from the absorption of oxygen by the salt, which, being thereby converted into a persulphate, became insoluble in the juices of the plant, and consequently clogged up the canals by which the sap is conveyed.

But in all these instances the poisonous quality of the substance was evinced by the more or less rapid decay of the plant that had imbibed it; whereas, where nitrate of strontian was employed, the functions of life appeared to go on for a considerable time without material obstruction.

Upon the whole, then, I see nothing, so far as experiments have yet gone, to invalidate the conclusion, to which the preceding facts appear to lead, that the roots of plants do, to a certain extent at least, possess a power of selection, and that the earthy constituents which form the basis of their solid parts are determined as to *quality* by some primary law of nature, although their *amount* may depend upon the more or less abundant supply of the principles presented to them from without.

XIII. *Review of the Order of* Hydrophylleæ. *By* George Bentham, *Esq., F.L.S.*

Read June 17th, 1834.

On the occasion of publishing some new ornamental species of *Nemophila* and *Phacelia,* received by the Horticultural Society from Mr. Douglas, the collector whom they had sent out to the North-west Coast of America, I have been led to examine the whole of the species of the small tribe to which they belong, contained in my own and the Horticultural Society's herbaria. The result having induced me to entertain some doubts as to the importance of some of the characters upon which the generic distinctions have been established, I have committed my observations to paper, together with a short review of the whole of the species of which the order is now composed, in the hope that they might not prove unacceptable to the Linnean Society.

This group of plants was first indicated as a natural order by Mr. Brown in his *Prodromus Floræ Novæ Hollandiæ,* where, with his usual acumen and conciseness, he observes (p. 492.), "Distincti (a *Borragineis*) ordinis initia constituunt genera capsularia *Hydrophyllum, Phacelia,* et *Ellisia,* ob albumen copiosum cartilagineum, et folia composita vel alte lobata." To this group Mr. Brown afterwards gave the name of *Hydrophylleæ,* and added the *Nemophila* of Barton (Bot. Mag. 50. t. 2373.), and a new genus under the name of *Eutoca* (App. to Franklin's Voyage). These five genera, together with one I now propose to name *Emmenanthe,* contain the whole of the thirty-two species now known; or if it should appear, upon further observation, that *Nemophila* should be considered as a section of *Ellisia,* and *Eutoca* be joined to *Phacelia,* the whole tribe would be reduced to four natural and well-defined genera.

All these plants agree in those essential characters which, as stated by Mr. Brown, separate them from their nearest allies, the *Borragineæ,* that is to say, in their capsular fruit and copious albumen; and the structure of the

ovarium, as far as it goes, appears to be the best character that can be taken for generic distinctions. In order to show how far any others may be brought in aid, I shall proceed to examine them separately.

In general habit and foliage, the distinction between *Hydrophylleæ* and *Borragineæ* is not always so marked as appeared from the species first known. Several *Phaceliæ* and *Eutocæ* have exactly the habit of *Echium, Cynoglossum,* or *Anchusa*; and some of the latter genus have the leaves constantly entire, although the "folia composita vel alte lobata" do run through the greater number of species. Some *Nemophilæ* may be compared to *Asperugo,* which has frequently opposite leaves (though always entire) and the same fragile trailing stem. The rough hispid hairs are the same in both tribes. As amongst one another, *Hydrophyllum, Emmenanthe,* and *Nemophila* have each a peculiar habit; but *Eutoca* and *Phacelia* are so much blended together in this respect that it would be difficult to assign any character derived from the vegetative organs peculiar to either genus.

The gyrate inflorescence of *Borragineæ* may be very readily observed in *Hydrophyllum, Phacelia, Eutoca, Emmenanthe, Ellisia,* and in *Nemophila aurita* and *phacelioides*; but in the remaining *Nemophilæ* it is (as in *Asperugo*) axillary, and can therefore only serve as a specific, not as a generic character, and in the general description of the order it must be considered in the light of a subsidiary, not an essential character.

The calyx is usually the same as in the majority of *Borragineæ,* inferior, persistent, and deeply 5-cleft, but with this particularity, that in some instances the sinuses (as in some *Campanulaceæ*) are furnished with reflexed appendages, resembling the erect divisions of the calyx in form, but smaller in size. As shown by M. Alphonse De Candolle in his *Monographie des Campanulées,* p. 11, these divisions do not indicate any organic modification in the composition of the calyx, but are merely owing to the prolongation of the united lateral nerves of two adjoining sepals, as is rendered evident by the nervation of the calyx of *Ballota, Marrubium, Leucas,* and other *Labiatæ* with more than five teeth to their calyx. The character derived from this circumstance must consequently be inconstant, and have little or no relation to general habit, as may be observed in *Hydrophyllum,* where it would separate *H. appendiculatum* from its close allies *H. canadense* and *virginicum*; and if

that be really the only distinction between *Nemophila* and *Ellisia*, it proves the expediency of uniting these two genera, more especially as in *N. parviflora* and *pedunculata* the appendages are sometimes scarcely perceptible, or even entirely wanting, and at other times nearly half as long as the calyx.

Ellisia Nyctelea has, indeed, another character, derived from the same organ, which distinguishes it from *Nemophila*, that is, the large size and expansion which it acquires after the fall of the corolla; but this, again, is but a character of *degree*, in respect of which the *Ellisia chrysanthemifolia* would stand intermediate between the two genera, and is not, therefore, available to separate them.

The corolla of *Hydrophylleæ* varies in general form from campanulate to rotate, showing but rarely (*Eutoca phacelioides*) an approach to the infundibuliform corolla of most *Borragineæ*. But these variations are slight, difficult to characterize, and so little in relation to general habit as to be unavailable for generic distinction.

I have never observed in *Hydrophylleæ* any trace of those corolline appendages, or squamæ, which may be termed *laminal*, from their position at the base of the limb of many infundibuliform corollæ, whether monopetalous (as *Borragineæ*), or polypetalous (as *Caryophylleæ*); but the *unguicular* or *tubal* squamæ are often remarkably prominent. These squamæ are analogous to those placed at the base of the tube of many *Borragineæ* (having at the same time ligular squamæ at the mouth of the tube), and to the annulus of hairs or scales in the tube of many *Labiatæ*.

The *laminal* squamæ are evidently of no organic importance, but mere excrescences of the petals, showing an approach to a transformation analogous to that by which the ligulæ are converted into anthers, but for a different purpose, whatever that purpose may be. But many circumstances might induce a supposition that the case may be different with regard to the tubal squamæ. Their origin is always below that of the stamina, and in some cases (as in *Emmenanthe* and some *Eutocæ*) they appear to be connected with the filaments of the stamina in a manner analogous to the abortive filaments in pentandrous *Caryophylleæ*, *Paronychieæ*, and *Amaranthaceæ*. On the other hand, like the ligular squamæ, although constant in form in the same *species*, they vary much in the most natural *genera*, such as *Ajuga*, *Salvia* and *Stachys*

in the *Labiatæ, Echium* in *Borragineæ,* or *Eutoca* and *Phacelia* in *Hydrophylleæ,* being present or absent in two species otherwise very closely allied. In *Hydrophylleæ,* their form is very variable. In general their centre is entirely blended with the corolla, and their broad dilated margins, embracing the basis of the filaments, are alone visible; but in the genus *Hydrophyllum* they appear to be constantly linear, adnate along the back, but free at the upper extremity and the margins. In *Emmenanthe* and some *Eutocæ,* as also in *Echium vulgare* and several *Cynoglossa,* they are reduced to ten very small orbicular squamæ, placed quite at the base of the corolla; and in *Eutoca grandiflora* and *parviflora, Phacelia fimbriata,* and some others, they disappear entirely, a transverse nerve connecting the base of the stamina alone indicating their usual position.

The stamina in all *Hydrophylleæ* are much alike, of equal size, and regularly divergent; their only differences are in the unimportant character of length and in the hairiness of the filaments. The anthers are always oblong or linear, with parallel cells.

The style, in several species, shows readily to the naked eye the real structure of those *Labiatæ, Borragineæ,* &c., which are said to have a simple style, with two subulate stigmata. The style is, on the contrary, in fact bifid, each lobe bearing at the extremity a small stigma. The ovarium of *Emmenanthe* is covered with a glandular pubescence; that of all other *Hydrophylleæ* is clothed with white erect rigid hairs. The style of *Phacelia* and *Eutoca* is usually more deeply cleft than in the other genera, but the latter character is very uncertain.

The placentation of the ovarium is of great importance in the generic distribution of *Hydrophylleæ.* In *Hydrophyllum, Nemophila,* and *Ellisia* the two placentæ are broad, fleshy, line the whole ovarium, adhere at the top and basis only, being free from the parietes, and bear on their inner surface each of them from two to sixteen ovulæ placed in two vertical rows, one on each side of the central line. In *Eutoca, Phacelia,* and *Emmenanthe* the placentæ are linear or slightly dilated, and adhere more or less to the parietes along their central line, bearing on their inner surface from two to fifty or sixty ovulæ, arranged either in two rows, or covering the whole surface without any apparent arrangement.

As the fruit ripens, the broad placentæ of the three first-named genera con-

tinue to line the capsule without adhering to it, forming, as it were, an inner capsule, and at complete maturity dry up into a thin membrane. In *Eutoca*, *Phacelia*, and *Emmenanthe* they are converted into spurious dissepiments, which in some species meet in the centre so as to divide the capsule into two cells, and in *Emmenanthe* are, moreover, considerably dilated in the centre. In *Eutoca Mexicana* the adhesion with the parietes breaks off, and the fruit assumes the appearance of an unilocular polyspermous capsule with two central placentæ. The same thing appears to take place in *Phacelia fimbriata*, but I have not seen any capsule in a state far enough advanced to be certain of the fact.

The form of the capsule, ovoid or globose in most *Hydrophylleæ*, is oblong-linear and compressed in *Emmenanthe*.

The number of ovulæ appears to have been the character chiefly relied upon in the formation of the genus *Eutoca*, and is, indeed, the only one which separates it from *Phacelia*, there being two only to each placenta in *Phacelia*, and often a great number in *Eutoca*. This character, however, is very uncertain, and forms very unnatural groups, whether we draw the line at 2, 4, 6, or 8 to each placenta, or between the definite number, arranged in two rows on the one side, and the indefinite number, without apparent arrangement, on the other. The same character also, if applied to *Nemophila*, would dissever *N. insignis* from *N. phacelioides*, and *N. pedunculata* from *N. parviflora*.

The seeds of all the *Hydrophylleæ* I have been able to examine appear to be the same as those of *Eutoca* described by Mr. Brown in the above-quoted Appendix to Franklin's Voyage.

From the above observations, and the characters of the six genera of which *Hydrophylleæ* are now composed, it would appear that *Hydrophyllum* is a very natural genus, though difficult to characterize. *Nemophila* and *Ellisia*, when taken together, are a natural group, but are separated by a purely artificial character, and the same thing may be said of *Eutoca* and *Phacelia*. *Emmenanthe* consists of but one species, so peculiar in its appearance and several characters that it will probably always remain distinct and well marked.

I now proceed to a short synopsis of the genera and species of which the order consists.

HYDROPHYLLEÆ. *R. Brown.*

Calyx inferus, persistens, profunde 5-fidus, sinubus sæpe appendiculis reflexis auctis. *Corolla* monopetala, hypogyna, regularis, breviter 5-fida, rotato-campanulata vel rarius subinfundibuliformis. *Stamina* 5, perigyna, lobis corollæ alternantia, æstivatione inflexa. *Antheræ* versatiles, biloculares, loculis parallelis longitudinaliter dehiscentibus. *Ovarium* superum, simplex, uniloculare. *Stylus* elongatus, bifidus. *Stigmata* 2, terminalia. *Placentæ* 2 à dorso liberæ vel parietibus adnatæ, facie interiore 2—multi-ovulatæ. *Fructus* capsularis, bivalvatim dehiscens, nunc unilocularis, placentis maximis capsulam implentibus, nunc semidissepimentis vix completis subbilocularis. *Semina* extus reticulata. *Albumen* copiosum, cartilagineum. *Embryo* conica, radicula ad hilum spectante.

Herbæ americanæ, more Borraginearum hispidæ. Folia sæpius lobata, alterna, vel inferiora opposita. Flores in racemis vel spicis unilateralibus scorpioideo-circinnatis subdichotomis dispositi, vel rarius in axillis foliorum solitarii pedunculati.

I. Hydrophyllum. *Linn. Gen. p.* 83.

Squamæ corollinæ 5, lineares, dorso adnatæ, apice marginibusque liberæ. *Stamina* longe exserta. *Placentæ* maximæ, dorso liberæ, ovarium implentes, 2-ovulatæ.

Folia radicalia numerosa; caulina pauca alterna lata pinnatim vel palmatim dissecta. Racemi scorpioideo-dichotomi ebracteati.

1. H. appendiculatum (*Mich. Fl. Bor. Am.* i. 134.), foliis infimis pinnatisectis, caulinis palmato-lobatis, racemis laxissimis, calycis hispidi sinubus reflexo-appendiculatis.

Nemophila paniculata. *Spreng. Syst.* i. 569.

Folia radicalia fere *H. virginici,* suprema iis *H. canadensis* similia. Pedicelli calyce fructifero fere duplo longiores. Calyx *Nemophilæ.* Habitus omnino *Hydrophylli.* (*v. s. sp.*)

I have received this plant from Mr. Drummond, who gathered it in the Alleghanies.

2. H. canadense (*Linn. Spec.* 208.), foliis palmato-lobatis angulatisve, florum cymis laxis, calycibus glabris.

H. canadense. *Bot. Reg.* iii. *t.* 242.

Folia late rotundata, utrinque glabra vel pilis raris hispida, lobis vix ad medium folii attingentibus, margine dentibus paucis argutis notata. Pedicelli calyce plerumque breviores. (*v. s. sp.*)

From Canada and Pennsylvania.

3. H. virginicum (*Linn. Spec.* 208.), foliis pinnatisectis, segmentis inciso-dentatis, florum cymis laxiusculis, laciniis calycinis anguste linearibus ciliato-hispidis.

H. virginicum. *Bot. Reg.* iv. *t.* 331.

Folia supra pilis sparsis hispidula, subtus pallida, glabra; segmenta 2—3-juga, inferiora subpetiolulata, suprema cum terminali sæpius confluentia. (*v. s. sp.*)

Received from Pennsylvania from Dr. L. de Schweinitz.

4. H. capitatum (*Dougl. MSS.*), foliis pinnatisectis, segmentis inciso-dentatis, florum cymis densissimis, laciniis calycinis lanceolatis ciliato-hispidis. (*v. s. sp.*)

Found by Mr. Douglas, in 1826, in fissures of moist rocks in the interior of Columbia in North-west America. These specimens have the leaves hispid on both sides, the segments but little divided, and narrowed at their base. In other specimens, gathered in shady moist woods on the north-west coast, named *H. cœlestinum* by the same collector, the leaves are larger, with broader segments, much more cut, and the flowers fewer, differences naturally attributable to the locality. Again, the same plant occurs in the Californian collection, but with the leaves much more hispid on the upper surface, and covered with a whitish down underneath.

II. Ellisia. *Linn. Gen.* i. 97.

Calyces exappendiculati. *Squamæ corollinæ* 10, breves, vel nullæ. *Stamina* corolla subbreviora. *Placentæ* maximæ, dorso liberæ, ovarium implentes, 2-ovulatæ.

Folia pinnatim dissecta, inferiora opposita. Pedunculi inferiores oppositifolii, superiores in racemo laxo unilaterali simplici dispositi.

1. E. NYCTELEA (*Linn. Gen.* 97.), petiolis exappendiculatis, foliis pinnatifidis, lobis subincisis, calycibus fructiferis valde auctis.

Calycis fructiferi segmenta ovato-lanceolata, acuta, foliacea, semipollicaria. (*v. s. c.*)

I only know this plant from specimens gathered in European botanic gardens. It is said to grow on the Potowmac in Virginia, and on the Missouri.

2. E. AMBIGUA (*Nutt. Gen.* i. 118.), "decumbens, ramosa; caule glabro subglauco, foliis hirsutis lyrato-pinnatifidis subsessilibus, segmentis sublanceolatis angulato-dentatis lobatisve, racemis oppositifoliis lateralibus terminalibusque, corollis parvis calyce vix longioribus, segmentis emarginatis.

"Common in alluvial soils on the banks of the Missouri."

I am wholly unacquainted with this plant.

3. E. MEMBRANACEA, glaberrima, petiolis exappendiculatis, foliis pinnatifidis, segmentis integerrimis, calycibus vix auctis.

Folia tenuia, lobis divaricatis lato-lanceolatis obtusis. Flores parvi, pedicellati, laxe racemosi. Corolla alba. (*v. s. sp.*)

From Mr. Douglas's Californian collection.

4. E. CHRYSANTHEMIFOLIA, hispido-scabra, petiolis basi auriculato-dilatatis, foliis subbipinnatifidis, lobis inciso-dentatis obtusis, calycibus fructiferis parum auctis.—Flores *E. membranaceæ.* Corollæ squamæ dentatæ. (*v. s. sp.*)

From California. *Douglas.*

III. NEMOPHILA. *Barton.*

Calycis sinus dentibus reflexis appendiculati. *Squamæ corollinæ* 10, breves, vel nullæ. *Stamina* corolla subbreviora. *Placentæ* maximæ, dorso liberæ, ovarium implentes, 2—12-ovulatæ.

Herbæ annuæ, diffusæ, fragiles. Folia inferiora opposita, omnia pinnatifida. Pedunculi nunc axillares, uniflori, nunc pauci ad apices ramorum in racemis brevibus dispositi.

1. N. parviflora (*Dougl. MSS.*), foliis pinnatifidis, lobis paucis latis subdentatis, calycis sinubus breviter appendiculatis, corollis calycem vix superantibus, placentis 2-ovulatis.

Flores parvi. Calycis appendiculi sæpius brevissimi interdum evanidi, rarius post anthesin elongati. Squamæ corollinæ parvæ, angustæ. (*v. s. sp.*)

Received both from Mr. Douglas and Dr. Scouler from the Columbia.

2. N. pedunculata (*Dougl. MSS.*), foliis pinnatifidis, calycis sinubus breviter appendiculatis, corollis calycem vix superantibus, placentis 6-ovulatis.

Habitus, calyx et corolla omnino *N. parvifloræ.* Folia angustiora, longius petiolata, lobis magis integris distinctisque. (*v. s. sp.*)

Gathered by Mr. Douglas on the Columbia.

3. N. phacelioides (*Barton, Fl. Amer.* 61.), petiolis exappendiculatis, corollis calycem breviter superantibus, calycis sinuum appendiculis lanceolatis ipsiusque dimidium æquantibus, placentis 2-ovulatis.

N. phacelioides. *Bot. Mag. t.* 2373. vix *Bot. Reg.*

The above character is taken from the figure and description in the Botanical Magazine, as I have not seen the plant. It appears very nearly allied to *N. parviflora,* differing chiefly by the flowers, which are twice as large as the larger appendiculæ of the calyx. The figure in the Botanical Register, vol. ix. t. 740, appears to me to represent the *N. insignis.*

4. N. aurita (*Lindl. Bot. Reg.* xix. *t.* 1601.), petiolis basi auriculato-dilatatis, calycis sinuum appendiculis elongatis, corollis calyce duplo longioribus, placentis 2-ovulatis.

Folia dum opposita basi connata; lobi lanceolati integerrimi divaricati vel ad basin folii spectantes. Pedunculi ad apices ramorum subracemosi. Corolla fere pollicem diametro. (*v. s. sp.*)

From Mr. Douglas's Californian collection.

5. N. insignis (*Dougl. MSS.*), petiolis exappendiculatis, corollis calyce duplo longioribus, placentis 10—12-ovulatis.

N. phacelioides. *Bot. Reg.* ix. *t.* 740.?

Foliorum lobi utrinque 3—4, integerrimi vel incisi. Pedunculi folio lon-

giores. Corolla plus pollice diametro. Squamæ corollinæ basi villosæ. (*v. s. sp.*)

From Mr. Douglas's Californian collection.

6. N. Menziesii (*Hook. et Arn. Bot. of Beech. Voy.* 152.), "foliis omnibus pinnatifidis scabris, segmentis approximatis ovatis obtusis ciliatis subtridentato-lobatis, pedunculis oppositifoliis folio duplo longioribus, segmentis calycinis lanceolatis accessoriis minutis."

I have not seen this plant; and it does not appear that Hooker and Arnott, from whom I have borrowed the above characters, have examined the ovarium: but it is stated on the authority of Mr. Collie, who gathered the plant in California, that the capsule is polyspermous.

IV. Eutoca. *R. Br. App. to Frankl. Voy.*

Corolla decidua. *Ovarium* ovoideo-globosum, piloso-hispidum. *Placentæ* lineares, dorso parietibus ovarii adnatæ, 4—multi-ovulatæ. *Capsula* dissepimentis incompletis, semi-bilocularis.

Herbæ annuæ? sæpius erectæ, habitu *Phaceliæ*, rarius diffusæ vel divaricatæ. Flores racemosi densi sessiles, vel laxi pedunculati, cymis unilateralibus simplicibus vel dichotomis.

1. E. Douglasii, diffusa, foliis omnibus pinnatifidis, lobis ovatis subintegerrimis, placentis 12—20-ovulatis.

Folia fere omnia radicalia, hispido-scabra, lobis utrinque 4—6. Caules floriferi adscendentes, basi foliis paucis instructi, apice nudi multiflori. Pedunculi elongati. Flores ampli fere *Nemophilæ insignis*, ad quam hæc planta habitu refert. (*v. s. sp.*)

From Mr. Douglas's Californian collection.

2. E. Cumingii, erecta, scabro-pubescens, foliis elongatis pinnatisectis, lobis oblongis obtusis subincisis, placentis 6—8-ovulatis.—*E. brachylobæ* affinis. (*v. s. sp.*)

My specimen, gathered in the Andes of Chili by Mr. Cuming (no. 313.), is very young, and so much pressed in the drying, that the ovarium was the only

part of the single flower I had which I could extract in a state fit for examination. The corolla appears to be shorter than the calyx.

3. E. BRACHYLOBA, erecta, scabro-pubescens, foliis elongatis pinnatifidis, lobis ovatis obtusis subincisis, placentis 6—8-ovulatis.

Folia petiolata, 2—3-pollicaria, lobis utrinque 6—2 vix ultra medium folii attingentibus. Pedicelli breves. Racemi dichotomi fere *Phaceliæ circinatæ*. (*v. s. sp.*)

From California. *Mr. Douglas.*

4. E. MEXICANA, diffusa, foliis ovato-oblongis inciso-pinnatifidis, lobis ovatis oblongisve utrinque glabris, placentis 6—8-ovulatis.

Racemi elongati, simplices. Flores pedunculati, duplo majores quam in *E. parviflora*, cui hæc planta cæterum affinis. Filamenta ut in ea pilosa, et squamæ corollinæ nullæ. (*v. s. sp.*)

Received from G. J. Graham, Esq., with a collection of about 400 beautifully dried Mexican plants gathered by him in the neighbourhood of the mines of Tlalpuxahua, and between that place and the city of Mexico.

5. E. PARVIFLORA (*Br. App. to Frankl. Voy.*), diffusa, foliis pinnatifidis trifidisve, superioribus quandoque indivisis, lobisque inferiorum ovatis oblongisve integerrimis utrinque hispidis, placentis 6—8-ovulatis. (*v. s. sp.*)

Phacelia parviflora. *Pursh.*

Received from Pennsylvania from Dr. L. de Schweinitz; and from the Alleghanies from Mr. Drummond.

6. E. LOASÆFOLIA, erecta, hispidissima, foliis ovatis pinnatifidis, lobis latis acutis inciso-dentatis, corollis calycem vix excedentibus, staminibus exsertis, placentis 6—8-ovulatis.

Habitus omnino *Phaceliæ*. Ex omni parte pilis longis rigidis pubescentia viscosa intermixtis hirsutissima. (*v. s. sp.*)

From California. *Mr. Douglas.*

7. E. FRANKLINII (*Br. App. to Frankl. Voy.*), "erecta, foliis pinnatifidis bipinnatifidisve, ovulis placentæ singulæ 20-pluribus."

I have not seen this plant, but Mr. Brown's detailed description and figure leave nothing to desire in its history.

8. E. MENZIESII (*Br. l. c.*), erecta, foliis linearibus lanceolatisve integerrimis quandoque trifidis pinnatifidisve, placentis 20—multi-ovulatis.

E. multiflora. *Dougl. Bot. Reg. t.* 1180. E. echioides et E. glomerata. *Dougl. MSS.* Planta latitudine foliorum et statura variabilis, at exemplaria Douglasiana cum charactere Browniano omnino conveniunt. (*v. s. sp.*)

Gathered by Mr. Douglas on sandy dry soils in the interior of the Columbia and California.

9. E. SERICEA (*Graham in Edinb. Phil. Journ.* 1830, *July, p.* 172.), "suberecta, foliis utrinque sericeis pinnatifidis, laciniis extrorsum incisis superioribus linearibus integerrimis, ovulis placentæ singulæ numerosis multis abortientibus, staminibus corolla triplo longioribus."

Raised in the Edinburgh garden, from seeds collected by Captain Franklin in his second Arctic expedition. I have not seen the plant, which is fully described by Dr. Graham.

10. E. GRANDIFLORA, adscendens, foliis lato-ovatis dentatis basi subcordatis, placentis ultra 50-ovulatis.

Caulis vel ramus in exemplare suppetente ultra pedalis, subsimplex. Folia sesquipollicaria, fere totidem lata, rugosa, uti caulis et calyces hispida. Racemi ad apicem plures, circinati. Calyces subsessiles. Corolla ultra 1½ poll. diametro. Squamæ nullæ. Filamenta glabra. (*v. s. sp.*)

A single specimen of this handsome plant was sent by Mr. Douglas in his Californian collection.

11. E. DIVARICATA, caulibus dichotomo-divaricatis, foliis omnibus ovatis indivisis, placentis 12—20-ovulatis.

Folia omnia alterna. Racemi multiflori, unilaterales. Flores subsessiles. Calyx fructifer valde auctus. Corolla pallide cœrulea, calycem paullo excedens. (*v. s. sp.*)

From California. *Mr. Douglas.*

12. E. phacelioides, erecta, ramosa, foliis omnibus ovatis indivisis integerrimis, placentis 4-ovulatis.

Habitus *Phaceliæ circinatæ,* at multo minor. Folia omnia alterna, petiolata. Racemi multiflori. Flores subsessiles. Calyces hispidissimi. Corolla subinfundibuliformis, calycem parum excedens. Stamina intra tubum inclusa. (*v. s. sp.*)

From California. *Mr. Douglas.*

V. Phacelia. *Juss.*

Corolla decidua. *Ovarium* ovoideo-globosum, piloso-hispidum. *Placentæ* lineares, sæpius dorso parietibus ovarii adnatæ, 2-ovulatæ. *Capsula* dissepimentis subcompletis pseudo-bilocularis.

Herbæ annuæ vel perennes, erectæ vel diffusæ. *Flores* racemosi densi sessiles, vel laxi pedunculati, cymis unilateralibus simplicibus vel dichotomis.

1. P. malvæfolia (*Cham. Linnæa,* iv. 495.), hispida, foliis late cordato-ovatis lobatis, calycinis laciniis lineari-spathulatis hispidis, exteriore maximo, staminibus exsertis.

Found by M. de Chamisso in California, from whose description the above character is taken, not having myself seen the plant.

2. P. brachyantha, foliis ovatis integerrimis indivisis vel basi lobulis 1—2 auctis, corollis calycem vix excedentibus, staminibus inclusis.

Habitus *P. circinatæ.* Flores fere *Eutocæ phacelioidis,* sed placentæ constanter 2-ovulatæ. (*v. s. sp.*)

Gathered by Mr. Macrae, collector to the Horticultural Society, at the baths of Collina in the Andes of Chili.

3. P. circinata (*Jacq. fil. Ecl.* i. 135. *t.* 91.), foliis pinnatisectis quandoque indivisis, lobis oblongis ovatisve integerrimis inæqualibus, corollis calyce plus dimidio longioribus, staminibus exsertis.

Heliotropium pinnatum. *Vahl.* Hydrophyllum magellanicum. *Lam.* H. Aldea. *Rœm. et Schult.* Aldea pinnata. *Ruiz et Pav.* A. circinata. *Willd.*

Phacelia peruviana. *Spreng.* P. californica. *Cham.* P. heterophylla. *Pursh.* P. rudis. *Dougl.* (*v. s. sp.*)

Found on the Columbia by Mr. Douglas and Dr. Scouler; in California by M. de Chamisso, Douglas, Lay and Collie, &c; on Mount Orizaba in Mexico by Schiede and Deppe; in Peru by Ruiz and Pavon; in Chili by most of the collectors who have been there; and at the Straits of Magellan by Commerson and others.

4. P. integrifolia (*Torrey, Pl. Rocky Mount.* 222. *t.* 3.), foliis ovatis indivisis crenato-serratis, staminibus exsertis.

Banks of the Platte. *Dr. Torrey.* I have not seen the plant.

5. P. ciliata, scabro-pubescens, foliis pinnatisectis, segmentis oblongis obtusis subpinnatifidis, calycis laciniis ovatis submembranaceis reticulatis margine ciliatis, staminibus corollam subæquantibus.

Folia fere *Eutocæ Cumingii*; habitus *Eutocæ brachylobæ*, at placentæ 2-ovulatæ. (*v. s. sp.*)

From California. *Mr. Douglas.*

6. P. ramosissima (*Dougl. MSS.*), scabro-pubescens vel hispida, foliis pinnatisectis, segmentis ovatis obtusis subpinnatifidis, calycis laciniis oblongis viridibus hispidis, staminibus exsertis.

Rami elongati, divaricato-ramosi, paucifoliati. Flores quam in *P. circinata* parum minores. (*v. s. sp.*)

Gathered by Mr. Douglas in California and on the Columbia.

7. P. tanacetifolia, scabro-pubescens vel hispida, foliis bipinnatifidis, segmentis oblongis dentato-pinnatifidis, calycis laciniis oblongo-linearibus hispidis, staminibus exsertis.

Caules 1—1½-pedales basi ramosi. Flores cœrulei, parum minores quam in *P. circinata.* (*v. s. sp.*)

Sent by Mr. Douglas from California, where it appears to vary much in hispidity and in the size and number of the lobes of the leaves.

8. P. bipinnatifida (*Mich. Fl. Bor. Amer.* i. 134. *t.* 16.), "erecta, foliis pinna-

tifidis, laciniis inciso-lobatis, spicis plerumque bifidis oblongis multifloris, corollæ cœruleæ lobis margine simpliciusculis."

In the western woods of the Alleghanies and in Kentucky. *Michaux.* On the Missouri. *Torrey.*

From Michaux's figure, this plant, which I have not met with, has the habit of *P. fimbriata.*

9. P. FIMBRIATA (*Mich. Fl. Br. Amer.* i. 134.), assurgens, pilosiuscula, foliis pinnatisectis pinnatifidisve, laciniis integerrimis, racemis laxis, corollis fimbriatis, ovariis basi crassissimæ insidentibus.—Habitus *Eutocæ mexicanæ.* (*v. s. sp.*)

Communicated by Dr. Torrey, who gathered it in Kentucky. The specimens are, however, so much pressed and so young, that I am unable to determine whether there may not be some character in the capsule which might distinguish it from *Phacelia.*

VI. EMMENANTHE.

Corolla persistens. *Ovarium* oblongo-compressum, glanduloso-pubescens: *placentis* linearibus, dorso adnatis (8-)ovulatis. *Capsula* semidissepimentis completis ad axin incrassatis pseudobilocularis.

1. E. PENDULIFLORA.—Herba elegans, erecta, ramosa, subviscoso-villosa. Folia alterna, pinnatifida, semiamplexicaulia, at basi non auriculata. Racemi numerosi, erecti, graciles, ante anthesin circinati. Pedicelli tenues, flore longiores. Flores penduli, 5 lin. longi. Calyces pubescentes, subviscosi. Corolla campanulata, alba vel flavescens? basi intus purpureo-maculata, et usque ad maturationem fructus persistere videtur. Squamæ 10, minutæ, ad basin corollæ. Stamina corolla breviora. Fructus placentæ ad axin demum incrassatæ ut capsula subquadrilocularis evadit. (*v. s. sp.*)

From Mr. Douglas's Californian collection.

Mr. Douglas's *Phacelia furcata* is a Polemoniaceous plant allied to *Gilia*, and probably a new genus. Many other *Polemoniaceæ* have so much the habit

of some *Hydrophylleœ,* that they are occasionally mixed in herbaria; but the slightest examination of the parts of fructification will at once distinguish them.

Since the first sheet of this paper was printed off, the first part of the seventh volume of the Journal of the Academy of Natural Sciences of Philadelphia has been received, in which Mr. Nuttall describes, page 111, a new *Hydrophyllum* under the name of *H. macrophyllum,* discovered by Dr. Short in the forests of Kentucky. From his description it appears to me to be the same as Douglas's *H. capitatum*; for which it is therefore requested Mr. Nuttall's name may be substituted, as having the priority of publication.

At the moment of sending the present sheet to press, the first part of the fifth volume of the Transactions of the American Philosophical Society of Philadelphia has reached us. It contains a paper of Mr. Nuttall's on the Flora of Arkansas territory, with the following new species of *Hydrophylleœ*:

Ellisia microcalyx, glabriuscula, decumbens, foliis lyrato-pinnatifidis longe petiolatis, laciniis paucis (3—5) lateralibus obliquis inciso-dentatis intermedio trifido obtuso, floribus solitariis minutis.

Ellisia ranunculacea, subhirsuta, caule procumbente, foliis pinnatifidis subquinquelobatis, superioribus tripartitis inciso-dentatis obtusis longe petiolatis, racemis secundis paucifloris.

Phacelia hirsuta, caule erecto ramoso, foliis pinnatifidis superioribus sessilibus, segmentis integriusculis, calycis laciniis linearibus patentibus, corollæ lobis integris nudis, filamentis basi barbatis.

Phacelia glabra, erecta, foliis pinnatifidis, superioribus amplexicaulibus ciliatis, segmentis integriusculis, calycis laciniis ovatis, corollæ lobis integris nudis, filamentis basi barbatis.

XIV. *On* Diopsis, *a Genus of Dipterous Insects, with Descriptions of Twenty-one Species.* *By* J. O. Westwood, *Esq., F.L.S.*

Read November 5th, 1833; and November 4th, 1834.

THE immortal man whose name we, as a body, have adopted as our own, terminated his zoological labours by the publication of the "Dissertatio Entomologica, bigas insectorum sistens," scil. *Paussus* and *Diopsis*, as though, to use the words of his countryman Dalman, "Linnæo hoc, ut videtur, erat consilium, ut vellet absolvere illustrem suum cursum entomologicum per productum quoddam insigniter singulare, vix quidquam magis singulare excogitari potuit quam *Paussus* et *Diopsis*."

Of the former of these two genera, in its present state, as a family, I have given a detailed account, which the Linnean Society has done me the honour to publish in the 16th volume of its Transactions. In order to show in some degree my sense of this honour, I have taken up the latter genus, and I now beg to offer to the Society the present memoir as a fitting companion to my former communication; moreover, the now prophetic, but, at the time, erroneous reference by Illiger to the Linnean Transactions for a memoir upon this genus, had a second-rate influence in this choice of subject.

The chief interest of the genus *Diopsis* arises from the extraordinary elongation of the sides of the head into two cylindrical horns, which in some instances are as long as the whole body, and at the extremity of which the eyes, of a semi-globular form, are placed: the antennæ also are inserted near the extremity of these protuberances at a short distance before the eyes. At first sight these horns might easily be mistaken for antennæ; but they are inarticulated at the base as well as along the surface; they have, therefore, no independent motion, their movements being necessarily accompanied by those of the whole head: when, however, we recollect that they contain not only the infinity of nerves of the compound eyes at their extremities, but also those

producing the sensation of which the antennæ are the seat, we can easily imagine how necessary it is that the means of communication with the remainder of the head should be unbroken by articulations.

Linnæus observes that this genus, on account of these ocular peduncles, is distinguished "non a *Dipteris* solum, sed ab omnibus etiam insectis huc usque mihi cognitis." Since his day, however, other insects have been discovered presenting a somewhat similar formation: of these, the Dipterous genus *Achias*, Fabr., is nearly allied to *Diopsis*, and of this M. Guérin has given an account, illustrated by very good figures, in the first number of his "*Magasin d'Entomologie*," drawn from the original unique specimen described by Fabricius from the cabinet of M. Bosc, which, I am sorry to say, had suffered materially from the ravages of insects when I inspected it at the Jardin des Plantes*. From M. Guérin's figure it is evident, however, that the eyes only in *Achias* are fixed at the extremity of the peduncles, the antennæ being inserted in the middle of the face: the same remark is also applicable to several other insects with long ocular peduncles, which were at first described by Wiedemann as belonging to the genus *Achias*, but subsequently formed by him, in a memoir read at the meeting of German Naturalists in 1830, into distinct genera, namely, the *Plagiocephalus lobularis* and *Zygothrica dispar*, both brought from Brazil by M. Lund; to the latter of which (at least to the female) is also allied the *Trigonosoma perilampiformis* of Gray (Griff. Anim. Kingd., pl. 128.). In like manner the different species of the Strepsipterous genera *Xenos* and *Stylops*, as also the recently established genus *Halictophagus*, Curt., have the eyes placed upon very short footstalks. The genus *Elenchus*, Curt., however, belonging to the same order, does not appear to be so circumstanced, since Robert Templeton, Esq., who has written and kindly presented to me an account of this genus illustrated by figures, states that the eyes are sessile. Certain male *Ephemeræ* are also remarkable for having a supplemental pair of eyes placed upon short peduncles between the lateral eyes.

In the order Hemiptera (*Heteroptera*) De Geer has also figured three spe-

* The existence of this remarkable genus fortunately does not rest upon this single mutilated specimen, since Dr. Horsfield has been kind enough to show me a specimen of a distinct and very beautiful species with maculated wings, captured by himself in Java; and amongst the unascertained species at the East India House I noticed the female of this new species, in which sex the head is not broader than the thorax.

cies of *Cimicidæ* with ocular peduncles, in the 34th plate of his 3rd volume, fig. 17, 24, and 25, all from Surinam; of these, that represented in fig. 17 and 18, and described as the *Cimex lineola* of Linnæus, has been recently raised to the rank of a genus by Hahn under the name of *Largus,* and by Laporte under the name of *Euryophthalmus.* It is the *Cimex humilis* of Drury, *punctatus,* De G., and *puncticollis,* Laporte: the footstalks are very short, at least such is the case in a specimen which I have received from Brazil; but in De Geer's "*Punaise à yeux de Crabe*" (fig. 17.), the peduncles are at least as long as the breadth of the head. The *Astemma cornuta* of St. Fargeau and Serville (*Encycl. Méth.* x. 323.) has also the eyes placed upon peduncles nearly a line long. It is from Cayenne, and appears nearly allied to the latter. In none of the preceding instances, however, do the footstalks acquire the remarkable length which they possess in *Diopsis,* nor are the antennæ situated upon them.

But this lateral prolongation of the head into ocular peduncles is not confined to insects, strictly so called, but is found in a few instances in other classes and orders; and as these instances involve in some degree the doctrine that every affinity is connected with, and must be tested by, a corresponding analogy, I shall detail them, without, however, offering any opinion upon the doctrine itself.

In the class *Crustacea* we find that Dr. Leach applied the term *Podophthalma* to the great typical group containing the Crabs (order *Brachyura*), and Lobsters and Shrimps (order *Macrura*), as well as the genus *Squilla* (order *Stomapoda*), which last he did not consider as entitled to the rank of an order. In all these animals the eyes are carried upon footstalks moveable at the base, so that the eyes are retractile within the anterior cavities of the shell. In some instances, however, they are fixed, as in the Dipterous insects mentioned above. This occurs in the genus *Achæus* of Leach, according to whom* "it is the only known genus of *Brachyura,* except *Leptopodia,* whose eyes are not retractile." To these two genera is very nearly allied the recently established genus *Latreillia* of Roux (*Crustacés de la Mediterr., pl.* 22.); but the peduncles of the eyes are very long. The preceding are instances from the family of Spider Crabs, *Maiidæ,* Westw., or *Crabes triangulaires* of Latreille.

* Leach, *Malacost. Podophth.*, tab. 22.

To these may be added, from the Brachyurous family, *Ocypodidæ*, Westw., or *Crabes quadrilatères* of Latreille; the British genus *Gonoplax*, *Cancer angulatus*, Linn.; the American genus *Gelasimus*, and the New Holland one of *Macrophthalmus*, Latr. (*Règne Anim.*, 2nd edit., vol. iv. p. 44.); in all of which the footstalks are disproportionately long: but the greatest elongation in the *Brachyura* takes place in the genus *Podophthalmus*, Latr. (*Portunus Vigil*, Fab., Isle of France), belonging to the family *Canceridæ*, Westw. (*Crabes nageurs*, Latr.).

The order *Macrura* does not present any remarkable development in the length of the ocular peduncles in any species with which I am acquainted; but in the next order, *Stomapoda**, two tropical genera, *Lucifer* and *Podopsis*, have recently been described and figured by Mr. Thompson in his "Zoological Researches," remarkable not only for the great length of the peduncles, but also for the attenuated vermiform shape of their bodies and their luminous properties. To these I have added another, nearly allied, with equally long footstalks, under the name of *Stylophthalma*, founded upon a curious species figured by Slabber. The only instance which occurs of pedunculated moveable eyes in the great Crustaceous division of *Entomostraca*, is found in the three genera forming the order *Branchiopoda*. In the class *Arachnida* I have recently characterized a spider from Malabar under the name of *Phoroncidia aculeata*, in which the front of the cephalothorax is produced in front into a thick footstalk, at the extremity of which the eight eyes are placed (Zool. Journ. No. 20.). It is nearly allied to the cancriform *Epeiræ*†. (*Acrosoma*, Perty, Dil. An., art. BRAZ.)

This representative structure, moreover, is not confined to annulose animals, since it exists in other remote groups, and even amongst the higher animals, as though, amongst the *Vertebrata*,—to use the language of a fanciful German author,—the *Squalus Zygæna* of Linnæus had shot through the waves and landed in Java or Brazil, transformed into a Dipterous insect; whilst everybody is aware that amongst the *Testacea* the eyes of the Snails are placed at the extremity of long retractile footstalks.

* The number of remarkable and analogical forms contained in this group appears to me to be conclusive evidence of its rank as an order, although Mr. MacLeay, following Dr. Leach, is of a different opinion.

† The *Epeira curvicauda* of Vauthier, described in the *Annales des Sciences Naturelles*, has the two lateral eyes on each side placed at the extremity of a short common footstalk.

There are other peculiarities of structure, however, in the genus *Diopsis* which contribute to its interest. Of these, the 4 or 6 spines which arm the sides of the thorax and the extremity of the scutellum are remarkable. I am aware of only one Muscideous insect resembling it in this respect, the *Tetanocera bispinosa* of Wiedemann, which has only two spines on the scutellum. Latreille has, however, named an entire Dipterous group (*Stratiomidæ*, &c.), from their possessing similar scutellar spines, *Notacantha*; but in none of these are the sides of the thorax spined*. So also the two spines which arm the lower sides of the face, and those placed at the extremity of the four posterior femora, are exclusively confined to this genus, whilst the raptorial structure of the fore legs is not amongst its least interesting characters.

Respecting the CHARACTERS of this genus the most detailed descriptions hitherto given are those of Fabricius, Latreille, and Dalman, upon which, however, a very careful investigation of the *Diopsis Sykesii* has rendered a few observations necessary. Thus, Dalman describes the ANTENNÆ as "vix visibiliter triarticulatæ—articulo tertio subovato—seta *terminato*;" whilst Latreille correctly describes them as "compressæ articulis tribus, 1mo, minimo; 2do, cyathiformi; 3tio, suborbiculato;" incorrectly adding, "ad *basin* setigero,"—the seta being inserted on the upper margin of the third joint near its extremity. As to the TROPHI, the descriptions of Fabricius and Latreille do not coincide, and Dalman was unable to examine their structure so as to clear up the differences. Fabricius says, "Os haud prominens, proboscide, haustello palpisque. Proboscis magna, membranacea, geniculata, retractilis: stipite brevi, cylindrico, capitulo carnoso, bilabiato: laciniis æqualibus, conniventibus. Haustellum absque vagina, seta unica, cornea, setacea, acuta, in canalem dorsalem proboscidis recondenda. Palpi duo, elongati, conici, ad basin setæ inserti:" whilst Latreille merely observes, "Proboscis Muscarum. Palpi breves, cylindrici, subacuminati." In the *Diopsis Sykesii*, however, the mouth exhibits a more perfect organization than has hitherto been noticed in any of the great second division of the Athericerous *Diptera* to which it belongs, closely resembling, in fact, the structure of Latreille's first division of the

* I have more recently noticed in the collection at the East India House a species of *Sargus*, brought from Java by Dr. Horsfield, the thorax of which possesses lateral as well as scutellar spines. The same also occurs in the genus *Clitellaria*.

Athericera (containing the *Syrphidæ*), of which "le Suçoir se compose de quatre pièces, et non de deux comme dans tous les autres *Athericères*;" the two maxillæ being clearly developed* and very acute, and the palpi longer than the labrum, compressed, and broader towards the apex than at the base. The ABDOMEN exhibits another peculiarity, all the specimens which I have examined having the four basal joints soldered together, without any distinct articulation, on the upper side of the abdomen: this is the case even in *D. signata* and *fasciata*, in which the situation of the articulations is indicated by a black slender line. This structure is represented in Linnæus's original figure; but Dalman, who drew the figures accompanying his memoir, has represented the articulations of the basal segments in all his species.

DIOPSIS. *Linn. et Auctt.*

Characteres Generis.

Corpus parvum, elongatum, longitudine vix dimidium uncii æquans. *Caput* parvum, suprà subtrigonum, facie anticâ perpendiculari, subconicâ, subtùs truncatâ, muticâ, vel utrinque unispinosâ, latere supero vel vertice in medio ocellifero, et utrinque in *cornu* longissimum cylindricum plùs minùsve gracile subascendens, ad apicem oculiferum, et paullò ante apicem antenniferum divergens producto. Hæc cornua in medio vel pone medium setâ unicâ alteraque ad apicem supra oculos armantur. *Antennæ* minimæ, compressæ, 3-articulatæ articulo 1mo minimo transverso, 2do majori cyathiformi, 3tio suborbiculato suprà ferè ad apicem, setâ (basi articulatâ,) simplici longâ. *Os* in cavitate capitis inferâ retractile. *Proboscis* magna, membranacea, geniculata. Portio basalis magna, rotundata, et pro receptione partium oris internarum concava (an labri vera pars analogica ?). *Labrum* (dimidii labii longitudine) acuminatum, crustaceum, et pro receptione *linguæ* subtùs carinatum. *Lingua* labro paullò brevior, gracilis, compressa. *Maxillæ* distinctæ, linguâ breviores, graciles, acutissimæ. *Palpi* labii ferè longitudine, ad basin arcuati (articulati ?), compressi, versus apicem dilatati, pilosi. *Labium* magnum, stipite

* Since this account was written, Mr. Curtis has illustrated the genus *Borborus* in his "British Entomology," which he describes as possessing "maxillæ very small and linear." (*Brit. Ent.* 469.)

(mento?) brevi, cylindrico, apice vel capitulo carnoso, compresso, bilobato, corrugato, tenuitèr pubescenti. *Truncus* elongatus, subovatus, anticè attenuatus, *mesothorace* interdùm, *scutello metathorace*que semper utrinque unispinosis, hoc distincto, subquadrato. *Halteres* nudi. *Alæ* ut in *Calobatâ* reticulatæ, nervo angulari basali interno nullo. *Pedes* elongati, antici raptorii coxis longis, femoribus plùs minùsve incrassatis, et subtùs serie duplici denticulationum parvarum instructis, tibiis subarcuatis. *Femora* 4 postica gracilia, ad apicem interdùm unispinosa. *Tibiæ* posticæ inermes, rectæ. *Tarsi* 5-articulati, articulo 1mo longissimo. *Pulvilli* magni. *Abdomen* elongatum, angustum, plùs minùsve clavatum, ad basin attenuatum, suprà convexum, subtùs tamen concavum, *segmentis* 4 anticis arctè conjunctis, haud articulatis, ad basin suprà subcanaliculatum.

The *differentiæ sexuales* in this genus have not hitherto been clearly ascertained. Dalman says, "Abdomen maris lineare, feminæ pone medium incrassatum, subclavatum;" adding, "Ob formam abdominis in una eademque specie diversam, linearem nempe vel clavatam, illam maris, hanc feminæ sexum indicare, suspicari liceat." Dalman, however, had observed this variation in one species only, *D. signata*. From the differences, however, existing in specimens of *D. fasciata*, *D. assimilis*, and *D. Sykesii*, it would seem that the clavation of the abdomen is not confined to the female; whilst it also appears that in some species the males are distinguished by the greater length of the ocular peduncles: that this, however, is not always the case is evident from these organs not being longer in the slender specimens of *D. signata*, *fasciata*, and *assimilis*, than they are in the more robust ones. I observed, moreover, in the robust specimens of *D. Sykesii*, as well as in *D. fasciata*, a minute exserted style at the extremity of the last (incurved) segment of the abdomen: hence, taking the characters of all the species into consideration, it appears that the females are larger and more robust than the males, their abdomens more distinctly clavate, whilst the ocular peduncles of the males are more slender and often longer than those of the opposite sex*.

* The celebrated Danish traveller and naturalist M. Lund informed me that the males alone in *Diopsis* possess the elongated processes of the head; but it is evident that he referred to the insects which he had collected in Brazil, and which Wiedemann has described under the name of *Zygothrica dispar*.

Of the *history* of this genus few words will suffice. Linnæus in 1775 established the genus, and described one species only, *D. ichneumonea,* which name Fabricius adopted; but it would appear that the latter confounded, under that name, two species distinct from each other as well as from the original species. Illiger added another species, *D. nigra*; Donovan also described another from the East Indies under the name of *D. ichneumonea*; Say added a North American species, *D. brevicornis*; and Dalman, three new African species, noticing also Linnæus's and Illiger's species, and the confusion in the specific description of Fabricius, but overlooking Donovan's error. Wiedemann followed Dalman, adding another species, *D. Dalmanni,* and giving the Fabrician species as distinct under the name of *D. confusa,* making (together with Say's insect) 8 species; to which Mr. G. R. Gray has added another in Griffith's Animal Kingdom. In the following pages 18 species, together with 3 doubtful ones, are described*.

As in *Paussus,* the geographical range of *Diopsis* seems confined to the tropical climates of the Old World; the central parts of Africa (to which alone Dalman thought it restricted), the East Indies and Indian islands producing all the species, except Say's North American one, which scarcely seems to belong to the genus.

As to the *affinities* of the genus, Linnæus, from the existence of its halteres and small proboscis, was convinced that it was a Dipterous insect, although in its spinose thorax it differed very much from all the *Diptera,* approaching *Formica,* whilst in its long legs, clavate abdomen, and spotted wings it resembled the Ichneumons.

Latreille was very early aware of its affinity with the domestic fly, and he accordingly placed it in the great group *Muscidæ,* in the same division with the genera *Sepedon, Tetanocera, Oscinis, Calobata,* and *Achias* (*Gen. Crust. &c.,* vol. iv.). Fallen, who divided the *Muscidæ* into four subfamilies, placed *Diopsis* amongst the *Ortalides,* including *Sepedon, Tephritis, Sepsis, Micropeza,* &c. Dalman, however, from its short rounded antennæ, deemed it to belong to Fallen's *Micromyzidæ,* adding, "Melius forsan ad propriam familiam *Diopsis* cum *Achia* amandanda." Wiedemann, however, in his memoir upon *Achias,* ex-

* I have not been able to discover in our public libraries a copy of MM. Villars and Capelle's *Journal de la Société de Santé et d'Histoire Naturelle de Bordeaux,* in the first volume of which (p. 77.), I believe Latreille published a notice or memoir upon this genus.

cludes it from his "familia *Achiidarium*," probably on account of the form and position of its antennæ. Latreille also, in the second edition of the *Règne Animal*, removes it from *Achias*, and places it amongst his *Carpomyzæ*, immediately after *Calobata*, and before *Cephalia, Sepsis, Ortalis*, &c. With these genera, indeed, it appears the most nearly allied, not only in the elongate form of the body, but also in the maculation of the wings. The structure of the mouth, however, in *Diopsis*, previously described, seems to indicate the want of a decided affinity with these groups.

Hitherto no facts respecting the *habits* of this genus have been published. Dalman, evidently speaking from information supplied to him by Afzelius, states that the latter found his specimens merely by accident in the windows of houses. He has, however, made two observations, which are sufficient of themselves to prove him to have been a first-rate entomologist, rendering our regret at his loss the more painful: "Insectorum oculos valde prominentes semper fere vitam super sabula vel ad ripas indicare, ut colligere licet ex *Cicindela, Elaphro, Omophrone, Steno*, inter *Coleoptera*; *Salda, Alydo* inter *Hemiptera*. Ceterum oculorum prominentia præsertim insectis rapacibus videtur esse propria, et adaptata ad istum vivendi modum, ut in jam supra recensitis et in *Libellulinis, Hemerobio* et aliis;" adding, however, "Oris tamen ratio in Diopsi a præda capienda aliena videtur." The statement, however, which Colonel Sykes has been kind enough to furnish me with respecting the habits of *D. Sykesii*, subsequently detailed, prove that in regard to this genus Dalman was correct in his supposition that insects with prominent eyes affected moist situations, whilst the raptorial fore legs and the more developed structure of the mouth show that his latter observation cannot be far from correct.

As to the characters which constitute the *specific distinctions* observable in the following insects, it is to be noticed, that from an examination of not less than thirty-five specimens of *D. Sykesii*, variation in colour appears to be of the first importance in this group. It will be seen, however, from Dalman's observation upon *D. signata*, that even colour is liable to variation, although evidently only to a slight extent. Scarcely the slightest variation in this respect existed in any of the specimens of *D. Sykesii*. The length of the horns, which Dalman gives as one of the leading characters of his *D. macrophthalma*, is, as stated above, a sexual difference, and therefore ought not to be employed.

The size of the anterior femora, however, is a specific and not a sexual character, those parts being of equal size in both kinds of individuals.

It is worthy of remark, that in the species which have the wings unspotted, neither the sides of the mouth nor the extremity of the four posterior femora are, except in one instance, armed with spines.

The species may be arranged in four groups: 1st, those with clear wings, and the face and posterior femora unarmed; 2nd, those with an apical spot on the wings; 3rd, those having a subapical abbreviated fascia; and 4th, those with one or more entire fasciæ across the wings. In order, however, to place the typical species at the head of the genus, I shall alter the position of the groups as follows:

Sectio I. *Alis fasciâ abbreviatâ paullò ante apicem.*

Species 1. Diopsis Ichneumonea. *Linn.*

Tab. IX. Fig. 1.

D. capite rufescenti, cornubus oculiferis ferrugineis, thorace nigro, spinis flavis, alis ante apicem maculâ nigrâ, abdomine segmentis duobus (tribus?) ultimis nigris.

Long. corp. e figuris Linnæanis, lin. 4 vel 5.

Habitat in Africâ æquinoctiali? In Mus. ——?

Linné, Diss. de Bigis Insect. p. 5. *tab. f.* 1—5. *Amœn. Acad. vol.* viii. *p.* 303. *Fuessly, Archiv.* 1. *t.* (6.) *edit. Gale, p.* 19. *Gmelin, Syst. Nat. tom.* i. *pars* v. *p.* 2829. *Latreille, Hist. Nat. Gen. vol.* xiv. *p.* 376. *tab.* 14. *f.* 6—7. *Dict. d'Hist. Nat.* xxiv. 435. *tab.* 112. *f.* 6, 7. (e citat. Fabr. et Dalm.). *Gen. Crust. et Ins. vol.* iv. *p.* 353. *Dict. d'Hist. Nat. vol.* ix. *p.* 477. *pl.* D. *f.* 5, 6. *Cuvier, Règne Anim. ed.* 1. *tom.* iii. *p.* 650. *Olivier, Enc. Méth.* 6. 1. *p.* 276. *Lamarck, Anim. sans Vertebr. tom.* iii. *p.* 370. *Dalman, Act. Holm.* 1817. 211. *Anal. Ent. p.* 3. *No.* 1. *Oken, Isis,* 1820, *p.* 502. *Wiedemann, Ausser. Zweifl. Ins. vol.* ii. *p.* 557. *Shaw, Gen. Zool. Ins. vol.* ii. *pl.* 104.

"*Corpus* magnitudine *Formicæ rubræ,* statura *Ichneumonis. Caput* rufescens, dente utrinque ad os: extenditur hoc in duo cornua, patentia, longitudine thoracis, solida, neque articulata, uti antennæ, ferruginea, terminata oculo globoso, flexo, nigro. Adjecto juxta oculum puncto cum seta, antennæ

rudimento. *Thorax* niger, postice dentibus a tergo duobus subulatis, flavis, et utrinque solitariis ad latera. *Alæ* binæ, hyalinæ, versus apicem anterius puncto nigro. *Abdomen* (Ichneumonis) clavatum, subpedicellatum, articulis duobus ultimis nigris. *Pedes* flavi, femoribus anticis clavatis."

The above is a transcript of the Linnæan characters; but from a careful inspection of the original figures, several additional peculiarities are noticeable which do not exist in the description. In the latter, the two terminal abdominal segments alone are stated to be black, but in the figure the last *three* joints are represented as more darkly coloured than the anterior part of the abdomen. In the description no notice is taken of the situation of the ocelli, nor of the terminal spines of the femora, both of which characters appear in the figure. The existence of spines upon the ocular peduncles neither appears in the description nor figures. As to the colour of the base of the abdomen no statement is made; but as the *terminal* segments are mentioned as being black, it is evident that the preceding joints must have been of a different colour, which, from analogy, may fairly be considered to be red. As to the situation of the spot of the wing, it is quite clear, not only from Linnæus's description, "*versus* apicem *anterius* puncto nigro," but also from the figures, that the spot is not terminal, but placed at a short distance from the extremity of the wing. From the figures (which, however, in this respect are doubtless inaccurate,) it would seem that the ocular peduncles are more erect and less divergent than in the other species. Dalman has drawn up his description of this species from a comparison between the original description and figures, deeming the latter to be more deserving of attention than the former, to the correctness of which, however, I cannot agree; hence he is induced to consider that Linnæus's insect was a female, probably because the abdomen is clavate, and the ocular peduncles are only "longitudine thoracis;" these characters, however, as we have already seen, are not conclusive as to the sex. He also says, "Antennæ pallidæ seta nigra," although Linnæus is silent as to the colour of these parts. He adds, "collari rufescenti," whilst Linnæus says, "thorax niger:" it is true, that in Linnæus's figure the collar is represented of as light a colour as the head, but I think that Linnæus would not have omitted to mention the difference in colour of the front of the thorax, if

such had been the case, because he did not overlook the difference in colour of the thoracic spines. Further, the engraving ought not to be too much relied upon, since the base of the abdomen is nearly as darkly coloured as the terminal segments, and, as Dalman observes, the 4th and 5th longitudinal nerves are represented as running in a straight direction to the margin of the wing. In the last place, Dalman describes the halteres as "pallidi," although Linnæus is silent as to their colour.

I have been thus minute in noticing the characters of this species, not only because it is the original and typical insect in the genus, but also because upon the elucidation of its distinctions depends the specific rank of one, if not of two, of the other species which I have given. *D. Ichneumonea* does not exist in the Linnæan cabinet; the only species contained therein being that which I have named *D. obscura,* and which totally disagrees with the Linnæan description.

The doubts which exist respecting the characters of this species are moreover increased by those concerning its real *habitat.* Linnæus merely says, "Inclitissimo Lond. Anglorum Medico Dom. Doctori Fothergill, qui naturæ pervestigationem in summis habet deliciis, et maximam insectorum copiam, *præcipue* ex America septemtrionali et Guinea allatam, possidet, ad Nob. Dom. Præsidem excellentissimas suas collectiones, haud ita pridem, mittere placuit." The introduction of the word "præcipue" at once shows that the insects in Dr. Fothergill's collection were not exclusively from North America and Guinea, as recorded by Dalman and Wiedemann. Fuessly (according to Donovan) upon this ambiguous authority describes the insect as a native of Cayenne; Gmelin notes it as inhabiting *both* Guinea and America; Fabricius (probably, however, confusing three different species,) mentions Angola, Sumatra, and Congo; Latreille, on the authority of M. Perrin, a zealous naturalist of Bourdeaux, states it to be from the coast of Angola*; Donovan (evidently, however, speaking of a distinct species, notwithstanding his positive

* Latreille, in the *Dict. d'Hist. Nat.*, published an original description of the specimen brought from Angola by Perrin. He describes it as 5 lines long, with the head "fauve," thorax black, abdomen "fauve," with the two last segments black, wings "avec un point noirâtre *vers l'extrémité*;" thus confirming the Linnæan description in every particular, as well as establishing its locality as an African insect.

assertion that his insect was identical with the *D. Ichneumonea,*) has Bengal; whilst Dalman, ignorant of the true existence of any East Indian species, says, "Veri tamen videtur simile *D. Ichneumoneam* habere patriam Guineam, cum omnes hucusque rite cognitæ species hujus generis sint cives istius regionis." By recurring, however, to the Linnæan species of *Paussus*, the doubts may in some degree be diminished. Linnæus received both insects from the same source; Afzelius, after much inquiry, discovered that the *Paussus* was taken at the Bañanas, or the adjacent part of Sierra Leone and tropical Africa. Now the insect which I have described under the name of *D. collaris*, and which is the only species with the transverse subapical fascia on the wings whose habitat is clearly known, is from Senegal. Hence, therefore, from all the preceding circumstances, together with the fact that no true *Diopsis* has been found in the New World, I think we may safely consider that Linnæus's insect was from Guinea, or some other part of the coast of tropical Africa.

Species 2. Diopsis collaris, *mihi*.

Tab. IX. Fig. 2.

D. rufo-testacea, thorace (nisi collari rufo) nigro, alis maculâ transversâ, ante apicem positâ femoribus 4 posticis inermibus.

Long. corp. lin. 3¼. Expans. alar. lin. 6.

Habitat in Senegalliâ Africæ. In Mus. nostr.

Statura *D. apicalis* at brevior. Individuum nostrum e formâ abdominis fœmininum esse videtur. *Caput* rufo-testaceum, glabrum, nitidum, versus os attenuatum, ibique emarginatum et utrinque spinâ minutâ acutâ paullò divergenti armatum. *Haustellum* fuscum. *Facies* convexa, sulculo longitudinali tenui lineâque arcuatâ fuscâ in pedunculos oculiferos terminata, alterâque arcuatâ supra os. *Regio ocellorum* nigra. *Pedunculi* cum oculis capite et thorace conjunctim paullò breviores, obscurè ferruginei, apice nigri. *Spina intermedia* brevissima, pone medium sita. *Spina terminalis* ferè obsoleta. *Antennæ* fulvæ: *setâ* apicali nigrâ. *Oculi* nigri, ad basin ferruginei. *Collare* rufescens, ad latera posticè dilatata. *Thorax* niger, nitidus, suprà vix sericeus, subtùs magìs sericeo-cinerascens. *Scutellum* thoraci concolor. *Spinæ scutellares* flavæ, graciles (apicibus in specimine

nostro unico deteritis) et (e parte basali relictâ gracili) breves videntur. *Spinæ duæ metathoracicæ* breves, obscurè flavæ. *Halteres* albidi. *Abdomine* thorace cum capite paullò longius, clavatum, thoracis latitudine in parte latiori, ochraceo-testaceum, glabrum, nitidum, basi tantùm breviter obscuriore subnigro; subtùs concavum, pallidius, genitalibus fuscis. *Pedes* omnes abdomini concolores tibiis anticis tarsorumque anticorum apicibus obscurioribus. *Femora antica* clavata, raptoria; *posteriora* 4 linearia, apicibus absque spinis. *Alæ* hyalinæ, pallidissimè fuscescentes, fasciâ fuscâ abbreviatâ (scil. ultra nervum 3um et 4um haud internè extensâ) ferè ad apicem alarum sitâ, margine externo ferè recto, antico verò irregulari, (scil. inter nervos 3um et 4um dilatatâ et versus basin alæ paullò extensâ.)

Obs. A *D. Ichneumoneâ* abdominis apice lætè ochraceo-testaceo, et à *D. apicali* fasciâ alarum ante apicem sitâ, differt.

Species? 3. Diopsis pallida, *mihi.*

Tab. IX. Fig. 3.

In Musæo Britannico insectum præcedenti valdè affine conservatur, sed an speciem esse distinctam, vel varietatem fœminæ (ut pedunculi breviores indicant,) aut marem præcedentis (ut ex abdomine graciliori haberes), non possum determinare. Hujus insecti notas sequentes essentiales observavi.

Color ochraceo-testaceus in omni parte insecti multò pallidior est, et quasi testaceo-luridus, præsertim in pedibus et fasciâ versus apicem alarum; nervi etiam pallidissimi sunt. *Abdomen* gracile thorace angustius et illo e tertiâ parte longius, in medio paullò dilatatum, at clavatum non dici potest. *Oculorum pedunculi* breviores sunt quàm in præcedente. *Thorax* (nisi *collare*) niger, opacus, haud nitidus, cinerascenti-sericeus. *Abdomen* totum concoloratum est. *Femora postica* (saltem in pedibus duobus posticis,) spinâ apicali brevissimâ armata sunt. *Spinæ scutellares* scutello duplò longiores, fulvescentes.

Long. corp. lin. $3\frac{1}{2}$. Expans. alar. lin. $5\frac{1}{2}$. De patriâ hujus insecti intelligentiam nullam obtinere potui. Si tamen diversitas specifica hujus insecti tempore futuro confirmetur, utinam nomine supradicto designare.

Species 4. Diopsis nigra. *Illiger.*

D. nigra, alis fasciâ ante apicem lineari fuscâ.

Long. corp. lin. 3.

Habitat in Sierrâ Leonâ. In Mus. ——?

Illiger, Mag. fur Insektenk. vol. vi. *p.* 365. *Dalman, Anal. Ent. p.* 6. *No.* 5. *Wiedemann, Auss. Zweifl. Insekt. vol.* ii. *p.* 562. *No.* 6.

Corpus totum nigrum, pedibus posticis, oculorum pedunculis spinisque duabus, thoracicis brunnescentibus. *Alæ* hyalinæ, fasciâ parvâ lineari fuscâ ante apicem. *Femora antica* valdè incrassata. *Thorax* subtùs vestimento sericeo obtectus. A *D. Ichneumoneâ,* Linn., discrepat præsertim magnitudine minori coloreque nigro.

No further information has been published respecting this species than is given in Illiger's original German description, which I have translated into Latin as above.

Sectio II. *Alis maculâ terminali.*

Species 5. Diopsis apicalis. *Dalm.*

Tab. IX. Fig. 4.

D. rubra, abdomine concolori immaculato, thorace nigro nitido, alis in summo apice puncto fusco.

Long. corp. lin. $3\frac{1}{2}$, *Wied.*; $3\frac{3}{4}$, sec. fig. *Dalm.*

Habitat in Sierrâ Leonâ. In Mus. Viennensi, Schonherr et Wiedemann.

Dalman, Act. Reg. Holm. 1817, *tab.* 7. *Anal. Ent. p.* 5. *No.* 2. *tab.* 1. *f.* 1. 4. *Oken, Isis* 1820, *p.* 504. *tab.* 5. *f.* 1. *Wiedemann, Auss. Zweifl. Insekt. vol.* ii. *p.* 558. *No.* 2. *Latreille, Règne Anim. ed.* 2. *vol.* 5. *p.* 532.

"Magnitudo *Sepedonis sphegei.*" Individuum Dalmannianum e figurâ abdominis, ut videtur, fœmininum. "*Caput* rubrum, glabrum, nitidum, versus os attenuatum, ibique emarginatum, et utrinque spina acuta subrecta armatum. *Haustellum* pallide testaceum. *Frons* convexa, sulculo longitudinali parum profundo, lineaque arcuata nigra in cornua oculifera desinente. *Cornua* cum oculis capite cum thorace vix longiora, antice basi subcarinata, ferruginea, medio obscuriora, apice nigra, ibique spina acuta nigra armata. *Oculi* magni globosi, in mortuis pallidi. *Antennæ* rufes-

centi-pallidæ, seta nigra. *Thorax* supra niger nitidulus, subtus investimento subfugaci cinereo opaco obductus, collari angusto concolori. *Scutellum* thoraci concolor, in apice spinis duabus flavis, validis, scutello plus duplo longioribus, divergentibus, armatum. *Spinæ* duæ minores flavæ, metathoraci, inter alas et halteres, insertæ. *Abdomen* thorace cum capite paullo longius, clavatum, (subtus tamen concavum,) rufo-ferrugineum, glabrum, nitidum, immaculatum, subtus pallidius, genitalibus fuscis. *Pedes* omnes abdomini concolores (doch ein wenig mehr in's gelbe, *Wied.*), tibiarum tarsorumque apicibus saturatioribus; femora antica reliquis multo crassiora (non vero clavata); posteriora linearia, summo apice unispinosa. *Alæ* abdomine longiores, hyalinæ, disco nonnihil infuscatæ, et ipso apice macula orbiculari fusca notatæ. *Halteres* albi." *Alarum nervi* fusci. *Tarsi* saltem pedum posticorum albidi, nitidi.

Dalman, whose description I have copied above, observes, "A *Diopsi Ichneumonea*, Linn., differt hæc species præsertim abdomine unicolore et macula fusca alarum in summo apice, non ante illum sita;" to which Wiedemann adds, "Wenn die Zeichnung in der Linneischen Dissertation als vollig genau anzunehmen ist, so verhalt's sich allerdings so:" but of the correctness of Dalman's observation it appears to me there can be no doubt. The latter appears to have been acquainted with a single specimen in the collection of Schönherr, which, from the figure of the abdomen, appears to be a female; but Wiedemann, who also gave an original description containing several additional characters, which I have added above, possessed the species, and was also acquainted with specimens in the Vienna collection, all of which he gives as "♀," describing their ocular peduncles as "so lang find als kopf und ruckenschild zusammengenommen", and the abdomen as "keulformig."

Species? 6. Diopsis tenuipes, *mihi.*

Tab. IX. Fig. 5.

Insectum alterum possideo, præcedenti coloribus valdè affine, quod (e longitudine pedunculorum) marem ejus haberi potest. Ab illo præcipuè differt longitudine pedunculorum oculiferorum, qui cum capite et thorace e tertiâ parte sunt longiores, et in medio vix obscuriores; facies subtùs attenuata, dente utrinque longo divergenti. *Thorax* totus niger, nitidus. *Spinæ scu-*

tellares valdè elongatæ, flavæ, apice nigræ. *Femora* antica quàm postica tantùm paullò crassiora, tibiæ et tarsi pedum anticorum atque tibiarum duarum posticarum tarsorumque apices saturatiora. *Abdomen* rufum, elongato-clavatum, scil. segmentum 1um (longissimum e segmentis 4 basalibus constans) sensim ad apicem dilatatum, articulis duobus terminalibus brevissimis, sensim attenuatis. *Alarum discus* subinfuscatus, apiceque maculâ terminali sat parvâ.

Long. corp. lin. 3. Expans. alar. lin. 5½.

Habitat in Senegalliâ. *D. Bucquet.* In Mus. nostr.

Obs. Si cum indagatione futurâ hoc insectum ut speciem à præcedente distinctam determinatur, illud nomine supradicto designare volui.

Species 7. Diopsis indica, *mihi.*

Tab. IX. Fig. 6.

D. ferruginea, oculis thorace toto abdomine posticè alarum maculâ apicali spinisque scutellaribus nigris.

Long. corp. e fig. Donov. lin. 4. Expans. alar. lin. 6.

Habitat in Bengaliâ. *D. Fichtel.* In Mus. —— ?

Diopsis Ichneumonea. *Donov. Ins. of India, tab. ult. Rees' Encycl. vol.* xi. *pl.* ii. *fig.* 13.

Magnitudo et statura *D. apicalis.* E pedunculis oculiferis abdomineque clavato, figuræ Donovani sexum fœmineum indicant.

Caput testaceo-ferrugineum, facie os versus acuminatâ ibique in dentibus duobus parvis terminatâ, lineâque arcuatâ nigrâ ante verticem in partem anticam pedunculorum ductâ. *Pedunculi* cum oculis capitem et thoracem longitudine adæquant. *Thorax* totus niger. *Spinæ scutellares* longitudine mediocres, nigræ. *Abdomen* clavatum, articulo 1mo (longissimo) testaceo, articulis reliquis (duobus) nigris. *Pedes* testacei, femoribus anticis subclavatis. *Alæ* hyalinæ, maculâ subrotundâ terminali, fuscâ, basin alarum versus obscuriori.

Var. Insectum Javanicum in musæo Dom. Hope à cel. De Haanio communicatum (sub nomine *D. apicalis,* Wied.) staturâ et magnitudine *D. indicæ* benè convenit. Thorax hujus nitidissimus est, scutellum et spinæ

scutellares colore piceo parùm suffusa. Abdomen nitidissimum, saturatiùs ferrugineum apice nigro, alæque versus nervos transversos fusco nonnihil decoloratæ, apice pedunculorum oculiferorum, tibiis tarsisque anticis apiceque tibiarum posticarum obscurioribus.

Donovan, from whose figures and meagre description I have drawn the preceding characters, states that his specimens of this insect were brought from Bengal, where it was discovered by M. Fichtel, adding, "And they are most assuredly the *D. Ichneumonea* of Linnæus." There are, however, three objections to this assertion: 1st, *D. Ichneumonea*, according to the best authorities quoted above, is evidently an inhabitant of Western Africa; 2nd, the spines of the thorax are black in Donovan's figures (he *says* nothing of their colour), whilst they are yellow in *D. Ichneumonea*; and, 3rd, the spot on the wings in Donovan's insect is clearly terminal, whilst in *D. Ichneumonea* it is equally evident that it is a transverse fascia before the apex. Dalman and Wiedemann have followed Latreille in incorrectly adapting the reference of Donovan's figures to the *D. Ichneumonea*, without noticing the peculiarities mentioned above.

Species 8. Diopsis assimilis, *mihi.*

Tab. IX. Fig. 7, 8.

D. rufescenti-ochracea, abdominis apice saturatè fusco, thorace nigro, collari piceo, alis maculâ apicali nigrâ, femoribus posticis subinermibus spinisque scutellaribus ochraceis.

Long. corp. lin. 3½. Expans. alar. lin. 6.

Habitat ——? Specimina duo in Musæo Britannico hospitantur, quorum unum abdomen habet longius et gracilius (♂?), alterum robustius et paullò majus (♀?). Hoc etiam saturatiùs est coloratum.

Caput cum pedunculis rufescenti-fulvum, his apice obscuris et in speciminibus ambobus, thorace cum capite paullò brevioribus. *Oculi* nigri. *Antennæ* pallidæ, setâ longâ nigrâ. *Spinæ pedunculares* ordinariæ minutissimæ duæ, pone medium et propiùs antennas positæ quàm in præcedentibus; facie os versus acuminatâ, lateribus ferè rectis, dente brevissimo recto utrinque subtùs terminatâ. *Thorax* niger, obscurus, haud nitidus, cineras-

centi-sericeus. *Prothorax* et *scutellum* obscurè picea, spinis flavidis, scutellaribus scutello duplò longioribus, in specimine robustiori apice fuscis, in altero omninò flavidis. *Femora antica* speciminum amborum crassiora, subclavata; 4 *postica* subinermia. *Tibiæ* 4 *posticæ* (in specimine graciliori) in medio subcompressæ. *Tibiæ anticæ* et apex tibiarum duarum posticarum fusca. *Tarsi antici* suprà fusci, subtùs pilâ aureâ vestiti. *Alæ* basin versus latiores quàm in specimine nostro *D. tenuipedis*, hyalinæ; in medio, scil. versus nervum transversum intermedium, nonnihil infuscatæ, maculâ rotundatâ apicali nigrâ, apice ipso paullò pallidiori. *Abdomen*, in speciminibus ambobus, subclavatum (in uno gracilius), segmento 1mo longissimo, apicem versus attenuato, reliquis duobus brevissimis, sensim attenuatis, his fuscis, illo rufescenti-fulvo, apicem versus saturatiùs fusco.

Obs. Specimina duo hujus speciei in mus. Soc. Linn. Lond. nuperiùs observavi, in quibus femora 4 postica spinâ minutissimâ laterali, at vix conspicuâ apice armantur; tibiæque 4 posticæ in medio paullò obscuriores sunt, apiceque fuscæ, inde subannulatæ ante apicem videbuntur.

Species? 9. Diopsis abdominalis, *mihi*.

Specimen in musæo Soc. Linn. Lond. hospitatur, *D. assimili* habitu coloreque alarum optimè congruens, sed magnitudinem majorem, scil. long. $4\frac{1}{2}$ lineas habet, et abdomen ejus nihilominùs totum castaneo-nigrum est et nitidum; femora 4 postica spinâ minutissimâ apicali armantur; tibiæ obscuræ, 4 posticæ annulo subapicali pallidiori; spinæ scutellares et metathoracicæ piceo-nigræ; collare et scutellum nigra subnitida. Caput, pedunculi oculiferi femoraque ut in *D. assimili* colorata, at paullò obscuriora.

Obs. Hoc insectum cum specie prædictâ maximam habet affinitatem, tamen magnitudo ejus et color abdominis spinarumque scutellarium speciem distinctam, ut videtur, satìs indicant.

I may add that Dr. Leach, who partially arranged the *Diptera* belonging to the Linnean Society, placed this as distinct from the preceding species.

Species 10. Diopsis fumipennis, *mihi.*

Tab. IX. Fig. 9.

D. capite thorace toto abdomineque posticè nigris, hoc anticè saturatè ferrugineo, femoribus anticis gracilioribus, alis infumatis maculâ magnâ terminali nigrâ.

Long. corp. lin. 3. Expans. alar. lin. $5\frac{1}{2}$.

Habitat in Senegalliâ? In Mus. nostr.

Habitus et statura insecti superiùs descripti sub nomine *D. tenuipedis,* tamen paullò minor coloribusque obscuris diversa. *Caput* nigrum, facie os versus acuminatâ, et subtùs utrinque in spinam piceam terminatâ. *Pedunculi oculiferi* cum oculis quàm thorace cum capite ferè e tertiâ parte longiores, graciles, fulvo-picei, apice nigri, in medio spinâ perbrevi armati, alterâque apicali. *Oculi* ferruginei. *Antennæ* pallidæ. *Thorax* totus niger, nitidus, vix sericeus, et inter basin alarum et halteres spinâ brevi pallidâ utrinque armatus. *Spinæ scutellares* in specimine nostro unico deteruntur. *Abdomen* elongato-subclavatum, saturatè ferrugineum, apice obscurè fusco-nigrum (in coloribus abdomen *Cheilosiæ Brassicarum* simulans). *Pedes* lutei, tibiis tarsisque anticis apiceque tibiarum posticarum obscurè fuscis; femora antica tantùm paullò crassiora quàm postica et vix raptoria videntur, etsi subtùs serie duplici tuberculorum spiniferorum parvorum nigrorum instructa; femora 4 postica apice spinâ brevi armata. *Alæ* disco latè infuscato apiceque maculâ magnâ terminali nigrâ.

I at first hesitated whether this insect, which I purchased in Paris, was more than a variety of the *D. apicalis*; but the investigation of the characters of other species has induced me to consider its black head, dark terminal segments of the abdomen, and clouded wings, together with some other circumstances connected with its structure, noticed above, as sufficient to warrant its being regarded as a distinct species.

Species 11. Diopsis punctiger, *mihi.*

Notis plurimis *D. fumipenni* congruit, et varietatem ejus forsitan esse. Differt tamen magnitudine majori, alarum disco minùs infumato, thorace

minùs nitido, disco usque ad prothoracem evidentèr at subtilitèr punctato, præsertim scutellum versus, hoc valdè obscuro sericie subfuscescenti induto, spinis scutellaribus ferè longitudine thoracis nigris nitidis, pedibus paullò obscurioribus, femoribus posticis extùs, basin versus fasciâ obscurâ, tibiisque posticis totis fuscis.

Long. corp. lin. 3½. Expans. alar. lin. 6.

Habitat in Africâ Occidentali. In Mus. Dom. Hope.

Obs. Statura pedum anteriorum ferè ut in *D. fumipenne.* Pedunculi oculiferi pro magnitudine insecti nonnihil longiores, inde sexus masculinus indicatur.

Sectio III. *Alæ immaculatæ* (*facies subtùs et apex femorum* 4 *posticorum plerumque inermia*).

Species 12. Diopsis signata. *Dalm.*

Tab. IX. Fig. 10, 11.

D. pallidè testacea, thorace fusco cinereo opaco, abdomine ferrugineo, maculis lateralibus (vel potiùs fasciis) lacteis, tibiis posticis infuscatis, annulo pallido, collari rufo-testaceo, scutello testaceo.

Long. corp. variat.

Habitat in Sierrâ Leonâ. *Afzelius.* In Muss. Gyllenhal et Schönherr.

Dalman, Act. Holm. 1817, *t.* 7. *Anal. Ent. p.* 5. *No.* 4. *t.* 1. *Oken, Isis* 1820, *vol.* 505. *t.* 5. *f.* 4. *Wiedemann, Auss. Zweifl. Ins. vol.* ii. *p.* 561.

" Magnitudine variat, majores *D. macrophthalmæ* fere æqualis, aliæ duplo vel triplo minores. Habitus et summa affinitas *D. macrophthalmæ,* sed et coloribus differt, et cornubus oculiferis multo brevioribus, et media fronte subcarinata. *Caput* breve, testaceum, subdiaphanum, margine orali dilatato; frons convexa in medio carinula sat evidente, quæ vero summo dorso canaliculata videtur, posterius in lineam nigram arcuatam cornuum abiens. *Vertex* subinæqualis. *Cornua oculifera* thorace cum capite non longiora, crassiuscula, testacea, apice nigricantia, setis ordinariis nigris. *Oculi* obscuri. *Antennæ* testaceæ, seta nigra. *Thorax* supra fuscus, subtus cinerascens, certo situ colore margaritaceo fugaci micans, collari rufo-testaceo. *Scutellum* testaceum, spinis adscendentibus scutello duplo longioribus, concoloribus summo apice setula nigra terminatis. *Spinulæ*

metathoracis binæ ordinariæ breves, testaceæ. *Abdomen* thorace fere duplo longius, in nonnullis, forte maribus, gracile, lineare; in aliis, forte fœmineis, subclavatum; in utroque sexu testaceum, segmentis singulis, primo excepto, macula laterali lacteo-nitidula, sæpius margine confluente, unde oriuntur fasciæ emarginatæ, quarum tamen prima evidentior, vix emarginata. *Pedes* testacei, femoribus anticis valde incrassatis, subtus subtiliter crenulatis, reliquis simplicibus muticis; tibiæ anticæ obscuriores, posticæ infuscatæ, medio subcrassiores, annulo pallido. *Alæ* hyalinæ immaculatæ. *Halteres* albi.

" *Obs.* In exemplaribus nonnullis caput et pedes saturatius testacei, nitidi, in aliis pallidiores, opaci; in uno specimine abdomen subfuscum, maculis lacteis ut in reliquis."—*Dalm. l. c. p.* 6.

Species 13. Diopsis fasciata. *G. R. Gray.*

Tab. IX. Fig. 12, 13.

D. capite pedibusque luteo-fulvis, tibiis posticis albo-annulatis, abdomine ferrugineo fasciis albis, collari scutelloque cum thorace concoloribus nigro-cinereis.

Long. corp. ♂? lin. 2⅓, ♀? ferè lin. 3. Expans. alar. ♂? lin. 3¾, ♀? lin. 5.

Habitat ——? In Mus. Brit.

G. R. Gray in Griffith's Transl. Règne Anim. No. 34. *p.* 773. *pl.* 125. *f.* 3.

Habitus et summa affinitas cum *D. signatâ,* sed colore prothoracis scutelli spinarumque metathoracicarum abundè differt. E speciminibus duobus in Musæo Britannico conservatis, unum, quod minus est, coloribus pallidioribus, et abdomen multò gracilius habet. Hoc masculum opinor quamvis pedunculi ejus oculiferi (pro magnitudine insecti) non aut vix longiores sunt quàm in specimine majori, quod ex abdomine robustiori, apiceque stylifero fœmininum existimo.

Caput breve, pallidè luteum aut testaceum, facie os versus acuminatâ, inermi, margine orali subrotundatâ, suprà lineâ arcuatâ in pedunculos terminatâ. *Pedunculi oculiferi* capite concolores, apice obscuri et cum oculis, caput et thoracem longitudine adæquant, crassiusculi, setis ordinariis elongatis nigris. *Oculi* nigri, posticè ferruginei. *Antennæ* pallidæ, setâ nigrâ.

Thorax in ♂? nigro-fuscus, haud nitidus, in ♀? obscurior, sericeus, subtùs cinerascenti-sericeus; *collari* et *scutello* concoloribus. *Spinæ scutellares* scutello duplò longiores, testaceæ, apice nigræ; *metathoracicæ* breves, nigræ. *Abdomen* thorace ferè duplò longius, in ♂? sublineare, in ♀? robustum, subclavatum, et apicem versus attenuatum, in utroque sexu ferrugineum; segmento 1mo (longissimo) 4-fasciato, fasciis albis, 2do 3tioque ad latera posticè dilatatis; ante fasciam 1am albam fascia nigra etiam observatur, et basis seipsa abdominis fusca; segmenta reliqua apicalia margine postico graciliori albo ornantur. *Pedes* lutei aut subtestacei; femoribus anticis valdè incrassatis, in ♀ in medio, posticè fusco suffusis, apice in pari postico fusco; tibiæ et tarsi antici tibiæque posticæ fuscæ, hæ basi et in medio annulo pallidiori. *Alæ* hyalinæ, apicem versus paullò obscuriores. *Halteres* pallidi.

Species 14. Diopsis concolor, *mihi.*

D. thorace abdomineque concoloribus sericie pallidè luteo-fuscescenti indutis, hoc opaco cinereo tenuè trifasciato, pedibus ochraceis, tibiis posticis in medio pallido-annulatis.

Long. corp. lin. $3\frac{1}{2}$. Expans. alar. lin. 6.

Habitat in Africâ Occidentali. In Mus. Dom. Hope.

Descr. Habitus *D. signatæ* ♂ Dalm. Ex hoc et speciebus reliquis differt thorace et abdomine concoloribus sericieque fuscescenti tectis. *Caput* in specimine unico mutilatum. *Collare* nitidum, piceum. *Thorax* et *scutellum* nigra, suprà sericie luteo-fuscescenti, subtùs cinereo indutis. *Spinæ scutellares* elongatæ, piceo-nigræ: *metathoracicæ* nigræ. *Abdomen* thorace duplò longius, ferè lineare, quasi masculum, sericie opacâ pallidè luteo-fuscescenti indutum, segmento 1mo (longissimo) ante medium maculâ parvâ transversâ cinereâ, pone medium lineâ impressâ (articulationem simulanti) ejusdem coloris, apiceque segmenti tenuissimè cinereo cincto. *Genitalia* (e stylis duobus brevibus parallelis exsertis composita,) alba. *Alæ* immaculatæ, colore fuscescenti nonnihil (præsertim apicem versus) tinctæ. *Pedes* testacei, femoribus anticis subdilatatis, spinulisque subtùs armatis tibiis anticis ad apicem obscurioribus, tibiisque posticis in medio pallidiùs annulatis.

Species 15. Diopsis macrophthalma. *Dalm.*

Tab. IX. Fig. 14.

D. testacea, thorace atro opaco, abdomine sordide-testaceo, cornubus oculiferis dimidio corpore longioribus.

Long. corp. (e fig. Dalm.) lin. 3½.

Habitat in Sierrâ Leonâ. *Afzelius.* In Mus. Dom. Schönherr.

Dalman, Act. Holm. 1817. *Anal. Ent. p.* 5. *No.* 3. *t.* 1. *Oken, Isis* 1820, *vol.* 504. *t.* 5. *f.* 2. *Wiedemann, Auss. Zweif. Ins. vol.* ii. *p.* 557. *Westwood in Mag. Nat. Hist. No.* 26.

"Magnitudo *D. apicalis,* sed angustior, præter colorem a reliquis valde distincta cornubus oculiferis multo longioribus, magisque divergentibus. *Caput* testaceum, subpellucidum, fronte brevi convexa, margine orali dilatato, rotundato, omnino mutico. *Vertex* inter cornua subcarinatus, utrinque obsolete et leviter subsulcatus, antice linea transversa nigra, parum arcuata determinatus. *Cornua oculifera* dimidio corpore distincte longiora, testacea, apice nigricantia, latere anteriore subcarinata, setis medii apicisque nigris. *Oculi* subglobosi obscuri. *Antennæ* pallidæ. *Thorax* niger opacus, collari rufo-testaceo, nitido. *Scutellum* testaceum, spinis duabus concoloribus adscendentibus; in illæsis summo apice setula nigra terminatis. *Spinæ metathoracis* parvæ flavæ. *Abdomen* thorace duplo longius, (in nostro, forte masculo, lineare,) sordide-testaceum, opacum. *Pedes* omnes testacei; femoribus anticis valde incrassatis, subtiliter crenulatis, posterioribus simplicibus, apice muticis; tibiæ posticæ in medio paullo crassiores, infuscatæ, rudimento annuli pallidi. *Alæ* longitudine abdominis, hyalinæ immaculatæ, apice vix obscuriore. *Halteres* albi."—*Dalm. l. c. p.* 5.

Species 16. Diopsis thoracica, *mihi.*

Tab. IX. Fig. 15.

D. testacea, thorace atro nitido, scutello testaceo, cornubus oculiferis sordidis valdè elongatis, femoribus posticis apice spinigeris, facie utrinque spinosâ, alis immaculatis.

Long. corp. lin. $3\frac{2}{3}$. Expans. alar. lin. $7\frac{1}{2}$.

Long. sing. ocul. pedunc. lin. 3.

Habitat in Africâ Occidentali. In Musæo Dom. Curtis, olim in Musæo Dom. Lee.

Descr. Nova species *D. macrophthalmæ* affinis, sed facie spinosâ cæterisque differt. *Caput* testaceum, fronte lineâque arcuatâ subelevatâ transversâ subnigrâ, os versus dente valido armatum. *Cornua oculifera* longitudine thoracem cum abdomine æquantia, obscurè testacea, apice nigricantia; *setis* et *antennis* deteritis. *Oculi* obscuri. *Thorax* niger, nitidus: *collari* concolore. *Scutellum* testaceum; *spinis* 2 concoloribus (apicibus deteritis). *Spinæ metathoracicæ* 2, parvæ, flavæ. *Abdomen* thorace duplò longius, subclavatum, sordidè testaceum, pilosum, basi excavatione oblongâ notatum. *Pedes* testacei, graciles, femoribus anticis vix incrassatis, posticis apice spinigeris (saltem in pare ultimo). *Tibiæ* et *tarsi* pedum duorum anticorum obscuriores tibiisque duabus posticis basi et apice infumatis (rudimentum annuli pallidi exhibentibus). *Alæ* hyalinæ, immaculatæ, apice vix obscuriori. *Halteres* pallidi.

This very distinct species (which is in the cabinet of J. Curtis, Esq., F.L.S., by whom it has been kindly submitted to my examination, with a suggestion of the name which I have adopted above,) is very interesting from combining immaculate wings with armed femora and sides of the face, a combination which I have observed in no other species.

Species 17. Diopsis obscura, *mihi.*

Tab. IX. Fig. 16.

D. nigra, abdomine posticè pedunculis oculiferis tibiisque anticis fuscis, pedibus fusco-rufescentibus, tibiis posticis fuscis in medio annulo pallido.

Long. corp. lin. $2\frac{1}{4}$. Expans. alar. lin. $3\frac{3}{4}$.

Habitat in Sierrâ Leonâ. *Afzelius.* In Mus. Soc. Linn. Lond.

Species parva, coloribus obscuris distincta. *Caput* nigrum, facie fuscâ subtùs inermi. *Pedunculi oculiferi* thorace paullò breviores, crassi, fusci, apice nigri. *Oculi* obscuri. *Antennæ* fuscæ. *Thorax* niger; *collari scutelloque* concoloribus. *Spinæ metathoracicæ* 2, nigræ; *scutellares* scutello

duplò longiores, fusco-piceæ. *Alæ* immaculatæ. *Abdomen* clavatum (thoracis latitudine in ejus parte posticâ), nigrum, apice piceo-fuscum. *Pedes antici* fusco-rufescentes, femoribus incrassatis, paginâ posticâ infuscatâ, tibiis fuscis, tarsis obscuris. *Pedes intermedii* fusco-rufescentes, femoribus inermibus. *Femora postica* fusco-rufescentia, apice obscura, inermia, tibiis posticis fuscis in medio annulo pallidiori, tarsis obscuris.

A single specimen of this insect is contained in the cabinet of the Linnean Society, and is the only individual belonging to this genus at present existing in the collection, into which it was evidently introduced by Sir J. E. Smith, the label attached to it, giving its habitat and the name of its captor, being in the handwriting of our late President.

Species 18. Diopsis confusa. *Wied.*

" Picea, capite pedibusque ferrugineis, tibiis piceis." *Wied.*

" Long. corp. lin. 3." *Wied.*

" *Habitat* in Angola, Sumatra, Congo. Mus. Dom. de Sehestedt." *Fabr.* " Aus Afrika. In Koniglichen Museum zu Kopenhagen." *Wied.*

Diopsis ichneumonea. *Fabr. Syst. Antl.* 201. 1. *Dalman, Anal. Ent.* 3. 4.

Diopsis confusa. *Wiedemann, Auss. Zweifl. Ins. vol.* ii. *p.* 563. *No.* 7.

" Statura parva, elongata *Loxoceræ. Caput* orbiculatum, parvum, rufum: cornubus duobus parvis, erectis labii. *Oculi* pedunculo elongato, cylindrico, capite longiori inserti, globosi, nigri. *Thorax* gibbus, ater, postice spinis duabus elongatis, acutis. *Abdomen* atrum, compressum, basi angustatum. *Alæ* hyalinæ. *Pedes* testacei, tibiis posticis nigris. Variat forte sexu spinis thoracis atris et rufis."

The above is the original Fabrician description of an insect, which, as indicated by Dalman and Wiedemann, is perfectly distinct from that of the Linnæan species, with which Fabricius confounded it. Wiedemann, drawing his original description from a specimen in the Royal Museum at Copenhagen, from Africa (Sehestedt's specimen?), states that the " labii cornua erecta" of Fabricius are a pair of horizontal porrected (" vorragende") spines at the lower extremity of the face: the legs, he says, are neither rufous (rufi, " rothlich,") nor testaceous (testacei, " zeigelroth"), as described by Fabricius, but of a rusty yellow colour

("rostgelb" in the description, "ferrugineis" in the specific character given by Wiedemann), and that not only the posterior but all the tibiæ are pitchy-black ("pechschwarz") with the anterior femora clavate and the tibiæ somewhat arched : Wiedemann, however, has been careless enough to omit the colour of the spines of the thorax in the specimen which he examined from Africa. As it is evident that Fabricius entirely disregarded the Linnæan description, in which the scutellar spines are mentioned as "*flavæ,*" but described these spines as either red or black, varying, probably, according to sex, it would seem that he did not introduce the rufous colour of these spines from the Linnæan description, but from an actual examination; and as such a variation is clearly not sexual, it appears to me that he confounded two distinct species with clear wings, and consequently both different from the Linnæan species, under the name of the latter. Moreover, as Wiedemann has not noticed the colour of the spines in the African species, we may perhaps consider that they are of the general colour assigned to the insect, namely, piceous; in which case, the variety described by Fabricius with red spines would in all probability be the insect from Sumatra, and consequently a species distinct from any described in this memoir.

Sectio IV. *Alæ fasciis integris.*

Species 19. Diopsis Dalmanni. *Wied.*

Tab. IX. Fig. 17.

Ferruginosa, alis fuscatis limpido fasciatis.

Long. corp. lin. 3. In Mus. Westermann.

Habitat in Javâ. *Wied. Illustr. Gen. Achias.*

Wiedemann, Auss. Zweifl. Ins. vol. ii. *p.* 560. *No.* 4. *tab.* 10ª. *f.* 4.

Lævis, juxta scutellum colore flavido abdominisque parte apicali dilatatâ fuscescenti tincta. *Alæ* in medio obscurè fuscescentes, basi apiceque pallidiores, subfuscescentes, in parte obscuriori pone medium alæ fascia hyalina exstat e tribus maculis magnis composita, maculâ intermediâ inter nervos 3um et 4um paullò basin versus alæ extensâ; inter medium et apicem alæ fascia altera recta vix conspicua hyalina, atque juxta nervum intermedium transversum fascia tertia latior adsunt. Pone et subtus scapulas utrinque spina brevis et subobtusa adest, pone quam altera brevior et vix conspicua

invenitur, atque scutellum ipsum spinis duabus tam brevissimis armatur, quas pictor omisit in delineatione insecti.

Wiedemann does not state the colour of the legs nor the habitat of this species; but he has supplied the latter omission in his memoir upon *Achias*, where he states it to be from Java. In addition to the characters given above, which I have translated from Wiedemann's German description, the following are observable in his figure. The ocular peduncles are about the length of the abdomen, and slender; the anterior femora are rather thicker than the others, and the base of the abdomen for more than half its length is narrow and linear, and is suddenly clavate, and as broad as the thorax.

Species 20. Diopsis Sykesii. *G. R. Gray.*

Tab. IX. Fig. 18, 19.

D. nigra, abdomine in medio pedunculisque oculiferis piceis, pedibus fulvescentibus, alis fuscis hyalino-fasciatis.

Long. corp. lin. $3\frac{1}{4}$—$3\frac{3}{4}$. Expans. alar. lin. 6.

Habitat in Indiâ Orientali. *Sykes.* In Mus. Sykes, Gray, nostr.

Præcedenti alis fasciatis thoraceque 6-spinoso valdè affinis, at colore nigro spinisque scutellaribus longis diversa. *Caput* nigrum, vix nitidum, os versus attenuatum, dente subrecto utrinque armatum, facie in medio convexâ, lineâ longitudinali elevatâ. *Haustellum* pallidum. *Pedunculi oculiferi* in speciminibus robustioribus capite cum thorace paullò longiores, sed in aliis longitudinem corporis ferè æquant, piceo-nigri, spinâ unâ in medio, alterâque ad apicem supra oculos. *Antennæ* fuscæ. *Oculi* rufi. *Thorax* totus niger, opacus, investimento sericeo-subcinerascenti: *collari* et *scutello* concoloribus. *Mesothorax* supra locum insertionis alarum utrinque spinâ validâ, acutâ, piceâ armatum; alterâque breviori, obtusâ metathoracicâ: *scutello* etiam spinis duabus illo triplò longioribus, piceis instructo. *Abdomen* valdè clavatum, præsertim in individuis robustioribus, nigrum, apice articuli 1mi (longissimi) latè piceo, et utrinque (pone lineam articulationem præcedentem referentem) maculâ subpallidâ sericanti in certo situ conspicienda. *Alæ* fuscescentes, apicem versus obscuriores, sed basin versus ferè ad nervum medium transversum hyalinæ,

tantùm sub nervo interno paullò obscuriores sunt, pone medium fascia hyalina irregularis basin versus arcuata exstat; etiam ante apicem alarum fascia altera ferè recta hyalina apparet. *Pedes* fulvescentes, femoribus anticis in omnibus æquè subincrassatis; tibiis anticis piceis tarsisque subfuscis, femoribus 4 posticis ad apicem inermibus et obscurioribus; tibiis tarsisque etiam obscuris.

This beautiful species was collected in great numbers in India by Lieut.-Col. W. H. Sykes, F.R.S., &c., in honour of whom it has been suggested to me by Mr. G. R. Gray that it should be designated; a suggestion which I have much pleasure in adopting.

The former gentleman has kindly furnished me with the following notice respecting the habitat and habits of this species.

"*Habitat.* The hill fort of Hurreechunderghur in the western ghauts of the Deccan, at an elevation of 3900 feet above the level of the sea. Lat. 19° 23′ N., long. 73° 40′ E.

"The insect affects chasms or ravines in the lofty woods which encircle the mountain in belts in various places. Where the sunbeams occasionally pierce the woods and fall upon isolated or salient rocks in the above localities, they are seen in myriads, either poising themselves in the rays, or reposing on the spots on which the rays fall."

Species 21. Diopsis (Sphryracephala) brevicornis. *Say.*

Tab. IX. Fig. 20.

D. nigra, obscura, antennis pedibusque ferrugineo-flavidis, alis fasciâ apiceque fuscescentibus, pedunculis oculiferis brevissimis.

Long. corp. lin. $2\frac{1}{4}$ ♀. *Wied.* $\frac{3}{20}$ths of an inch. *Say.*

Habitat in Pennsylvaniâ Americæ Borealis. *Say.* In Mus. Say, Wiedemann.

Diopsis brevicornis. *Say, in Journ. Acad. Nat. Sciences, vol.* i. 1817, *p.* 23.

Achias brevicornis. *Say in litt.*

Diopsis brevicornis. *Wied. Auss. Zweifl. Ins. vol.* ii. *p.* 563. *No.* 8. *Illustr. Gen. Achias, pl.* 2. *Griffith, Transl. "Règne Animal," No.* 34. *p.* 774. *pl.* 62. *fig.* 2.

Sphryracephala brevicornis. *Say, American Entomology, vol.* iii. *pl.* 52.

Caput rufescens, vertice fusco. *Pedunculi oculorum* brevissimi (singulo longitudinem inter eorum bases haud æquanti) crassissimi, fusco-nigri. *Antennæ* in medio frontis insertæ, articulo 3tio rotundato, compresso, apice setigero. *Thorax* niger, cinereo cinctus. *Spinæ scutellares* 2 rufescentes et 2 laterales nigræ (inter alarum basin et halteres obviæ, at quàm in præcedentibus breviores). *Alæ* hyalinæ, fasciâ fuscescenti, transversâ, irregulari (præsertim ad marginem internum) pone medium alæ positâ, hæc fascia ad nervum intermedium transversum extendit et sub nervo 2do longitudinali magìs est obscura; apex ipse alarum maculâ fuscescenti angulum basin versus alæ formante distinguitur. *Pedes* rufescentes, femoribus tibiisque ad apicem nigricantibus; femora antica incrassata, piceo-nigra, femoribus posticis simplicibus. *Halteres* albi. *Abdomen* nigrum, immaculatum, clavatum.

Say, in the work first above quoted, described this insect as a *Diopsis*, and states that he took a single specimen in May 1817, seated on a leaf of the Skunk Cabbage (*Pothos fœtida*) near the Wissahickon Creek, a few miles from Philadelphia. Subsequently, however, it would seem that he regarded it as an *Achias*, as Wiedemann states that he received it from him under the name of *Achias brevicornis*, adding that, from the form and situation of the antennæ, it appeared to him rather to belong to *Diopsis*. Say afterwards discovered it in profusion in crevices of rocks on the banks of the Missouri, and published a figure of it in the 3rd volume of his American Entomology, under the new generic name of *Sphryracephala*, distinguished from *Diopsis* by the shortness of the ocular peduncles, and by having the "antennæ inserted in front, the third joint rounded and compressed, setigerous at the tip." Other characters are pointed out as distinguishing this genus from *Achias*, as the spinose thorax and scutellum; whence it appears, as Say observes, to be more intimately allied to *Diopsis* than to *Achias*. The geographical situation of the species, however, seems to indicate a type distinct from either of these two groups.

EXPLANATION OF TAB. IX.

Fig. 1. *Diopsis Ichneumonea,* after Linnæus.
2. *D. collaris.*
3. *D. pallida.*
4. *D. apicalis,* after Dalman.
5. *D. tenuipes.*
6. *D. indica,* after Donovan.
7, 8. *D. assimilis* (supposed ♂ and ♀).
9. *D. fumipennis.*
10, 11. *D. signata* (supposed ♂ and ♀), after Dalman.
12, 13. *D. fasciata* (supposed ♂ and ♀).
14. *D. macrophthalma,* after Dalman.
15. *D. thoracica.*
16. *D. obscura.*
17. *D. Dalmanni,* after Wiedemann.
18, 19. *D. Sykesii* (supposed ♂ and ♀).
20. *D. brevicornis,* after Say.
a—g. Details from *D. Sykesii.*
a. The mouth partly concealed in the oral cavity.
b. The mouth fully porrected.
c. The acute maxilla and its palpus, seen laterally.
d. The palpus seen in front.
e. The labrum.
f. The tongue.
g. The antenna.

N.B. The lines near the figures indicate the natural length and the expansion of the wings.

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Read December 2nd, 1834; and May 5th, 1835.

[Captain King having placed in my hands his South American insects, in order that such as were new might be described, I have the honour of laying before the Linnæan Society the results of the investigation, in which I have been assisted by the gentlemen whose names are mentioned above as having kindly cooperated with me in the undertaking.

The collection was formed along the coast from St. Paul's in Brazil to Valparaiso. The splendid objects of natural history that have been found from time to time in Brazil and sent to Europe render it less easy to detect novelties in that country; but those from the opposite coast of Chili are less known, and I have never seen any collection from the extreme south of the New World excepting the present one. It is curious and interesting to trace the similarity that exists in many instances between the corresponding parallels of the southern and northern hemispheres, and in others to observe the analogues which take the place of absent types. Throughout the whole of South America, for example, the genus *Carabus* appears to be unknown, excepting about latitude 50, where a species of that group with a narrow thorax has been found: the genus *Culex* also occurs; and many others might be noticed that not only approach, but are identical with, the typical forms of North America and of Europe. It may further be generally observed that the insects under consideration bear little resemblance to those from the Cape of Good Hope and the southern parts of Africa: and at the same time it may not be irrelevant to add, that I have been greatly surprised at the near approach made by many East Indian species to those of Europe, and even of England; and from the few I have had an opportunity of seeing, this remark may be applied also to some of those from Van Diemen's Land.—*J. Curtis.*]

Descriptions, &c. of the

HYMENOPTERA.

By A. H. Haliday, *Esq.*

*1. Ichneumon xanthorrhæus, *n. s.*

Abdominis cingulo pedibusque rufis, segmento septimo et ventre toto fulvis. Mas.

Long. corp. 4½ lin. Alar. 7¼ lin.

Mas. Niger. *Clypeus* et *mandibulæ* rufæ, hæ apice fuscæ. *Palpi* fulvi. *Antennæ* filiformes, graciles, longitudine corporis, articulis 34 oblongis. *Thorax* immaculatus. *Metathorax* areolatus, denticulo minutissimo utrinque instructus. *Pedes* rufi, posticorum tibiæ apice tarsique fusci; eorundem trochanteres, omnium verò coxæ nigri. *Alæ* hyalinæ, nervis et stigmate ferrugineo-fuscis. *Abdomen* lineare, planum; ventre anoque fulvis, puncto apicali segmenti primi et fasciâ, secundi apicem et tertii basin occupante, rufis.

In exemplari altero color rufus fusior per medium segmenti secundi ascendens cum puncto apicali primi conjungitur; huic etiam adest punctum rufum supra clypeum in medio faciei.

The depressed and oblong abdomen gives a peculiar character to this species, and may indicate a type of form different from any European groups: but until the female is known, it will be difficult to say anything certain on this head.

2. Ichneumon plebeius, *n. s.*

Abdomine rufo, segmento primo nigro; femoribus, tibiis et tarsis fulvis; alis flavescentibus. Mas.

Long. corp. 6½ lin. Alar. 12 lin.

Mas. Niger, pubescens, punctulatissimus. *Mandibulæ* apice rufescentes. *Antennæ* corpore breviores, crassiusculæ, setaceæ. *Thorax* immaculatus. *Pedes* fulvi seu crocei, coxis et trochanteribus nigris. *Alæ* flavescenti-hyalinæ, stigmate nervisque nigris. *Abdomen* rufum, segmento primo nigro, ultimis dorsi subfuscis.

Port Famine, Straits of Magellan.

* Those species with the asterisk attached are in the cabinet of Mr. Curtis.

3. Ichneumon patricius, *n. s.*

Abdomine rufo, segmento primo nigro; femoribus, tibiis tarsisque rufis; alis cyaneis. Mas.

Long. corp. $7\frac{3}{4}$ lin. Alar. $11\frac{1}{4}$ lin.

Mas. Niger, punctulatissimus. *Mandibulæ* apice rufæ. *Antennæ* corpore breviores, setaceæ. *Thorax* immaculatus. *Pedes* rufi, coxis et trochanteribus nigris. *Alæ* fusco-cyaneæ, punctis ordinariis hyalinis. *Abdomen* læve, rufum, segmento primo nigro.

Port Famine.

4. Phygadeuon prælatus, *n. s.*

Violaceus; pedibus rufis, coxis nigris, tarsis posterioribus medio fuscis; alis cyaneis; metathorace inermi. Mas.

Long. corp. 6 lin. Alar. $10\frac{1}{2}$ lin.

Mas. Violaceus, subtilitèr punctulatus. *Antennæ* compressiusculæ et medio nonnihil crassiores, thorace dimidio longiores, nigræ. *Thorax* immaculatus et granicè inermis. *Pedes* rufi, coxis et trochanteribus nigris, illis violaceo-micantibus. *Tarsorum* intermediorum articuli 3tius et 4tus, posticorum insuper secundus nigricantes. *Alæ* fusco cyaneæ, punctis ordinariis hyalinis at obsoletioribus. *Abdomen* posticè læve.

Port St. Elena.

TRACHYSPHYRUS.

Cryptorum subgenus *Phygadeuonti* forma corporis proximum, sed pedibus posticis nonnihil elongatis, adhuc magis autem horum tibiis tarsisque spinulosis distinguendum. *Antennæ* mutilatæ quidem, sed e reliquiis videntur fuisse breviusculæ, graciles, setaceæ.

5. Trachysphyrus imperialis, *n. s.*

Purpureus; femoribus tibiisque posticis rufis; alis cyaneis; metathorace bidenti; aculeo abdomine parùm breviore. Fem.

Long. corp. $7\frac{1}{2}$ lin. Alar. $11\frac{1}{2}$. Aculei 3 lin.

Fem. Purpureus, splendens, capite thoraceque sparsìm punctatis, metathorace et pectore reticulato-rugosis. *Antennæ* nigræ, scapo violaceo.

Mandibulæ nigræ. *Metathorax* utrinque dente valido obtuso instructus. *Pedes* nigri, coxis purpureis. *Femora antica* apice et tibiæ anteriores latere interno rufescentes. *Femora* et *tibiæ* posticæ totæ rufæ. *Alæ* cyaneæ, punctis ordinariis hyalinis; stigmate nervisque nigris.

This species is quite of tropical character, from its brilliancy and intense blue opake wings; the group which it represents is probably confined to warm countries, and is eminently distinguished from all European Ichneumons by the small spines which are scattered over its hind legs, as in many *Pompilidæ*.

This splendid Ichneumon was taken at Port Famine.

6. Cryptus bellicosus, *n. s.*

Annulo antennarum et tarsorum posticorum albo; alis fuscis; aculeo corpore plùs duplò longiore. Fem.

Long. corp. $6\frac{1}{2}$ lin. Alar. 11. Aculei, 15 lin.

Fem. Niger. *Apex labri*, punctum clypei, lineola orbitas ambiens et margo tenuissimus prothoracis albi. *Tarsi postici* articuli primi apice et quinti basi, reliquis totis albis. *Alæ* fuscæ.

Port Famine.

7. Pimpla sponsa, *n. s.*

Mesothoracis scuto, segmentis primo—sexto, femoribusque posticis coccineis; alis cyaneis; aculeo abdominis dimidio breviore. Fem.

Long. corp. $4\frac{1}{4}$ lin. Alar. 9. Acul. $1\frac{1}{4}$ lin.

Fem. Atra. *Antennæ* corpore breviores, filiformes. *Femora antica* apice tibiæ et tarsi latere interno flavicantes. *Femora postica* coccinea, apice nigra. *Alæ* fusco-cyaneæ, stigmate nervisque nigris, areolâ amplâ trigonâ. *Abdomen* coccineum, ano nigro.

Valparaiso.

8. Campoplex fugitivus, *n. s.*

Abdomine compresso, ventre fulvo; pedibus rufis, coxis nigris, trochanteribus anterioribus flavis, posticis nigris, tibiis posticis basi apiceque fuscis. Mas. —Aut, *abdomine minùs compresso, segmentis tertio—septimo rufis, intermediis dorso fusco-maculatis; pedibus rufis; coxis et trochanteribus anterioribus flavis, posticis nigris; aculeo brevissimo.* Fem.

Long. corp. $3\frac{1}{4}$ lin. Alar. $5\frac{1}{2}$ lin.

Fem. Niger. *Antennæ* vix corporis longitudine, graciles, filiformes, totæ nigræ. *Mandibulæ* flavescentes, apice castaneæ. *Labrum* et *palpi* flavescentes. *Thorax* immaculatus. *Pedes* rufi; coxæ anteriores flavæ, posticæ nigræ; trochanteres flavi, postici basi nigri. *Tarsi postici* fusci. *Alæ* hyalinæ, nervis fuscis, stigmate luteo, radice et squamulis stramineis. *Areola* petiolata. *Alarum* posticarum areola brachialis posterior apice recto terminata. *Abdomen* fulvum, segmento primo nigro, secundo nigro, angulis apicis fulvis; sequentia fulva, basi media fusca, ultima immaculata. *Aculeus* subexsertus.

Mas differt. *Coxæ* omnes nigræ. *Tibiæ posticæ* basi et apice nigricantes. *Abdomen* dorso nigrum, magis compressum quàm in feminâ.

Port Famine.

This species also presents nothing peculiar in its character; and though I cannot identify it with any described European species, yet it is such as would scarcely call for a remark by its occurrence in our own country.

9. Ophion luteus. *Linn.*

This specimen, taken at Port Famine, does not differ conspicuously either in size or other particulars from indigenous examples.

*10. Evania lævigata. *Latr.*

Rio de Janeiro.

*11. Chrysis cœrulans. *Fabr.*

Port St. Elena.

*12. Xylocopa Morio. *Fabr.*

Xylocopa Teredo. Guilding.

St. Paul's, Brazil.

*13. Megachile susurrans, *n. s.*

Capite thoraceque fulvo-hirtis; abdominis cingulis albidis; squamulis et pedibus ferrugineis; femoribus tibiisque anticis et metatarsis latere exteriori nigricantibus. Fem.

Long. corp. $4\frac{1}{4}$ lin. Alar. 9 lin.

Fem. Nigra. *Statura* brevis, valida. *Pedes* flavido-hirti. *Alæ* obscurè hyalinæ, nervis luteo-ferrugineis. *Venter* albido-barbatus.

Taken at St. Paul's by Lieut. T. Graves.

14. Megachile squalens, *n. s.*

Cinereo-hirta; abdominis cingulis albidis; alarum costâ nigricante. Fem.

Long. corp. 5 lin. Alar. 8 lin.

Fem. Nigra. *Statura* angusta. *Squamulæ pedes*que nigri. *Alæ* obscurè hyalinæ, apice fuscæ; nervis nigris et costâ latè nigricante.

St. Paul's, Brazil.

15. Cœlioxys prætextata, *n. s.*

Segmento primo, ventre pedibusque rufis; facie, thoracis punctis, abdominis cingulis et latere externo pedum albido-pubescentibus; scutello validè tridentato. Fem.

Long. corp. $5\frac{1}{2}$ lin. Alar. 9 lin.

Nigra. *Antennarum scapus* subtùs rufescens. *Mandibulæ* ferrugineæ, apice fuscæ. *Occiput* margine albido-ciliatum. *Thoracis* latera, pectus et metathorax albido-pubescentes; dorsum subnudum, scuti latera et puncta 2 antica, scutelli fascia basalis interrupta et punctum sub spinâ laterali albido-pubescentes. *Alæ* obscurè hyalinæ, apice fuscæ, radice et squamulis rufis. *Abdomen* rufum, suprà nigrum, segmento primo rufo; incisuræ angustè albidæ, ventris medio interruptæ.

St. Catherine's.

*16. Ancylosceles ursinus, *n. s.*

Fulvo-hirsutus, ore, squamulis et tarsis flavo-ferrugineis. Mas.

Long. corp. $4\frac{1}{2}$ lin. Alar. $9\frac{1}{2}$ lin.

Mas. Niger. *Antennarum scapus* subtùs maculâ apicali ferrugineâ. *Clypei color* ferrugineus, basi trifurcatus. *Labrum* et *basis mandibularum* ferrugineæ. *Tarsi posteriores* ferè flavi, apice summo fusco. *Alæ* hyalinæ, apice obscuræ. *Pili abdominis* et *pedum posteriorum* decumbentes, nitidiores, ferè aurei. *Abdomen* femoribus posticis haud multò majus.

Taken by Lieut. Graves at St. Paul's.

*17. Melipona favosa. *Fabr.*

St. Paul's; and Mr. Curtis has received it from Mexico.

18. Melipona ruficrus. *Latr.*

St. Catherine's.

*19. Trigona Amalthea. *Fabr.*

Huic exemplari caput totum nigrum.

St. Paul's.

*20. Bombus Cajennensis. *Fabr.*

Taken at St. Paul's; and Mr. Curtis has also specimens from Mexico.

*21. Bombus nigripes, *n. s.*

Ater; vertice, dorsoque thoracis et abdominis fulvo-hirtis; alis ferrugineis. Femina et aculeata.

Long. alarum Feminæ 25½ lin.; aculeatæ 12 lin.

Long. corp. Fem. 14 lin; aculeatæ 7½ lin.

Very abundant in Chili. *Lieut. Graves.*

22. Halictus rubellus, *n. s.*

Niger, nitidus, pubescens; abdomine rufo, apice nigro; tarsis apice rufis. Fem.

Long. corp. 4½ lin. Alar. 9 lin.

Fem. Niger, nitidus, pubescens. *Tarsorum articulus primus* ferrugineo-barbatus, articuli reliqui rufi. *Alæ* obscurè hyalinæ, stigmate et nervis fuscis aut ferrugineis. *Abdomen* dorso ferè glabrum, segmentis primo et secundo (vel totis, vel hujus apice medio demto) etiam quarti et sæpè quinti lateribus rufis: rima analis conspicua ciliata.

Chili.

*23. Halictus metallicus? *Fabr.* (Megilla.)

St. Paul's.

*24. Andrena cyanescens.

Nigra, cano-hirta; abdomine nitido cyaneo. Fem.

Long. corp. 5 lin. Alar. 8¼ lin.

Nigra, pubescentiâ canâ, modò femora postica subtùs et tibiæ latere externo nigro-villosæ. *Alæ* subhyalinæ, nervis nigris. *Abdomen* dorso ferè glabrum. *Venter* pubescens.

Chili.

*26. COLLETES OCCIDENTALIS, *n. s.*

Fulvo-hirtus; abdomine subconico basi retuso, fusco cingulis fulvis. Mas et fem.

Long. corp. 8 lin. Alar. 12½ lin.

Taken by Lieut. Graves in Chili.

*27. EPIPONE CYANEA. *Fabr.*

Taken at St. Paul's; also by my friend Edward Bennett, Esq., in Columbia.

28. POLISTES IGNOBILIS, *n. s.*

Cœruleus; alis obscurè hyalinis costâ fuscâ. Fem.

Long. corp. 5⅔ lin. Alar. 11 lin.

Fem. Obscurè cœruleus. *Clypei apex* medio productus, acuminatus. *Mandibulæ* prælongæ. *Laciniæ labii* prælongæ, apicibus pendulis, glandulosis. *Segmentum primum* infundibuliforme, subpetiolatum.

St. Paul's.

*29. POLISTES MULTIPICTUS, *n. s.*

Flavo fuscoque varius; antennis nigris; alis fuscescentibus. Fem.

Long. corp. 6 lin. Alar. 11½ lin.

Fem. *Caput* flavum. *Macula* magna, hexagona, fusca, verticem ferè totum occupans et punctum flavum præ ocellis includens: *macula* altera magna trifurca clypei basin signat, has sejungit macula cordata flava inter antennas. *Mandibulæ* apice ferrugineæ; *antennæ* nigræ. Occiput fuscescens. *Thorax* subtùs nigro flavoque varius; suprà nigricans, prothoracis margine, lineolis 2 dorsi, maculâ laterali scutelli, metathoracis fasciâ transversâ maculisque duabus pone illam flavis. *Pedes* flavi; liturâ externâ femorum anteriorum et posticis ferè totis ferrugineis; coxæ posteriores fusco-maculatæ. *Alæ* dilutè fuscæ, costâ lutescente. *Abdomen* nigrum, margine segmentorum flavo. *Segmentum primum* ferè infundibuliforme at brevius quàm præcedenti.

Exemplar alterum magis flavescens. Mesothoracis scutum lateribus flavum; femora tantùm postica subfusca.

St. Paul's.

30. Polistes biguttatus, *n. s.*

Niger; capite, prothorace apiceque antennarum et pedum ferrugineis; abdomine ferrugineo basi nigro punctis duobus flavis. Fem.

Long. corp. 8 lin. Alar. 17 lin.

Fem. *Caput* ferrugineum, vertice et occipite fuscis. *Antennæ* nigræ, articulis 2 ultimis undique, præcedentibus subtùs ferrugineis. *Thorax* niger, opacus, prothorace suprà ferrugineo. *Pedes* nigri; anticorum genua, tibiæ tarsique ferruginei, metatarsi nigri apice demto: intermediorum genua, tarsorum articuli 3 superiores apice, reliqui toti ferruginei: posticorum genua, tarsorum articuli superiores apice, sequentes subtùs ferè toti ferruginei. *Alæ* fusco-ferrugineæ. *Squamulæ* ferrugineæ. *Abdomen* ferrugineum, segmentis primo et secundo basi nigris, illo flavo-bipunctato.

The nest of this species is preserved; it seems to have been suspended by a short slender footstalk, and is formed of one layer, comprising 56 hexagonal cells of various depths.

*31. Polistes apicalis. *Fabr.*

St. Paul's.

32. Polistes Actæon, *n. s.*

Cyaneus; clypeo et metathoracis maculâ bilobâ flavis. Fem.

Long. corp. 7 lin. Alar. 12¼ lin.

Fem. Obscurè cyaneus. *Clypeus* flavus, basi lineolis 2 nigris e nigredene faciei continuatis. *Metathoracis margo* anticus flavo-lineatus. *Macula metathoracis* magna flava subquadrata at posticè bifida. *Tibiæ* et *tarsi* antici latere interno flavicantes. *Alæ* fuscæ, costâ obscuriore. *Abdominis segmentum primum* breve, haud petiolatum, margine apicis utrinque albicante.

St. Catherine's.

*33. Odynerus vespiformis.

Ater, villosus; alarum costâ, squamulis, antennis pedibusque rufis; his basi nigris. Mas et fem. *Clypeo et antennarum scapo subtùs flavis.* Mas.

Long. corp. fem. 7 lin., maris 6¼; alar. fem. 12½ lin., maris 11¼.

Fem. Ater, villosus. *Antennæ* rufæ. *Prothoracis margo* angustissimè albicans. *Pedes* rufi, coxis et basi femorum nigris. *Alæ* ferrugineæ, costâ a basi usque in stigma rufescente. *Squamulæ* rufæ. *Abdominis segmenta primum* et *secundum* margine angustissimo albicante.

Exemplar alterum segmento secundo toto nigro.

Mas. *Antennarum scapus* dorso nigro-lineatus, subtùs flavus, clypeus et labrum sulphurei. *Thorax* et *abdomen* toti nigri immaculati.

Obs. Thorax in hac specie anticè et posticè rotundatus, abdominis segmentum primum brevius et hirsuties *Vespæ* faciem simulant.

This species, which very much resembles a *Vespa*, was met with in some abundance by Lieut. Graves in Chili.

*34. Odynerus labiatus, *n. s.*

Abdominis cingulis duobus, margine prothoracis et clypeo flavis; antennis, pedibus, alarum costâ squamulisque rufis. Mas.

Long. corp. 6 lin. Alar. 11 lin.

Mas. Ater, capite et thorace subtilitèr punctulatis, pube molli nigrâ obtectis. *Antennæ* mutilatæ; articulus primus qui solus superest rufus. *Mandibulæ* apice rufæ. *Clypeus* sulphureus. *Prothorax* sulphureus, scapulis nigris. *Metathorax* minùs abruptè truncatus quàm sequenti, lineolâ longitudinali elevatâ. *Pedes* rufi, coxis nigris. *Alæ* ferrugineæ, costâ usque in stigma rufâ, dehinc fuscæ. *Alæ* posticæ ferè hyalinæ. *Squamulæ* ferrugineæ. *Abdomen* atrum, segmentis primo et secundo margine flavis, primo pubescente reliquis ferè nudis.

From Port St. Elena. Lieut. Graves took a female, and in that sex the clypeus is black.

35. Odynerus humeralis, *n. s.*

Abdominis cingulis duobus et strigâ prothoracis flavis; antennis, ore, pedibus, scapulis, alarum costâ squamulisque rufis. Fem.

Long. corp. 9 lin. Alar. 14 lin.

Ater. *Antennæ, clypeus, palpi* et *mandibulæ* rufæ. *Frons* atro-lanuginosa. *Labium* prælongum. *Rostrum* mandibulare capitis longitudine. *Thorax* rudè punctatus, anticè hispidulus. *Scutellum* et *latera metathoracis* lanu-

ginosa. *Scutellum* lineolâ longitudinali impressum. *Metathorax* truncatus, lineolâ longitudinali elevatâ, lateribus angulato-elevatis et serrulatis. *Prothorax* rufus, medio flavus. *Pedes* rufi, coxis nigris. *Alæ* ut in præcedente. *Squamulæ* rufæ. *Abdomen* atrum, segmentis primo et secundo margine flavis.

Taken with the last.

36. Dicœlius Merula, *n.s.*

Ater; alarum costâ, tibiis tarsisque rufis. Fem.

Long. corp. 8½ lin. Alar. 15 lin.

Fem. Ater punctulatissimus, villosus. *Caput* breve, rotundatum, pone oculos latè convexum. *Os* breve. *Thorax* immaculatus. *Prothoracis margo* reflexus, elevatus. *Femora* apice, tibiæ tarsique rufi. *Tibiæ* et *tarsi* latiusculi, nonnihil compressi. *Calcaria intermedia* minuta, subulata, posticorum alterum subulatum, alterum breve, latum, compressum, apice emarginatum. *Alæ* fuscæ, costâ usque in stigma rufâ, areolâ cubitali secundâ ferè trigonâ. *Abdominis segmentum primum* pyriforme (ferè ut in *Eumene coarctatâ* efformatum) pubescens; secundum campanulatum et sequentia glabra.

Chili.

*37. Sphex Latreillii. *St. Farg.*

Guerin's Mag. d'Ent., pl. 33. ♂.

Valparaiso and Conception. Mr. Curtis is of opinion that the *Sphex Thunbergii* of Le Peletier St. Fargeau is the female of this superb insect.

*38. Pompilus Gravesii. *Curtis's MSS.*

Aureus, maculatìm versicolor; antennis basi pedibusque rufis; alis aurantiacis, maculis 2 *fuscis.* Fem.

Long. corp. 9 lin. Alar. 10½ lin.

Fem. *Statura* elongata, ferè ut in genere *Salio.* *Thorax* valdè compressus. *Metathorax* elongatus. *Color* corporis fuscus, clypeo, ore, ano et segmentorum marginibus lateralibus rufescentibus; at totus tomento aureo denso decumbente obductus, unde color aureus flavo fuscoque tessellatus. *Mandibulæ* apice emarginatæ. *Antennæ* fuscæ, basi rufæ. *Palpi* rufi. *Pedes*

rufi. *Tibiæ* posticæ latere altero levitèr serrulatæ, setulis minutis adspersis. *Tarsi antici* haud pectinati. *Alæ* vix corporis dimidii longitudine, tomentosæ, aurantiacæ; anticæ maculis 2 magnis fuscis, alterâ in medio transversè sitâ marginem utrumque attingente, alterâ rotundatâ intra apicem alæ. *Venter* anticè et lateribus ferè glaber; an casu detritus?

Presented to Mr. Curtis by Lieut. T. Graves, R.N., in honour of whom it is named.

39. Pompilus bilunatus. *Curt. MSS.*

Long. corp. 10 lin. Alar. 13 lin.

Fem. Sericeus, atro-virens, abdominis segmento secundo suprà aureo in medio interrupto et maculas duas semiorbiculatas formante.

Maldinado (Gorrite).

40. Pompilus ferruginipennis, *n. s.*

Cyaneus; antennis alisque rufis. Fem.

Long. corp. 10 lin. Alar. 18 lin.

Fem. A *P. Heroë* differt antennis et tarsis gracilioribus, horum anticis haud ciliatis. *Antennarum scapus* niger. *Clypeus* griseo-tomentosus. *Alæ* rufæ, costâ concolore, radice nigro-cyaneæ, apice fuscæ.

Cape Gregory.

41. Pepsis Heros. *Fabr.*

Conception and Gorrite.

CHIRODAMUS.

Genus intermedium inter *Pompilum* et *Planicipitem*. Pedibus hunc referens, illum alis et thoracis formâ.

42. Chirodamus Kingii, *n. s.*

Niger; antennis, tibiis tarsisque anticis testaceis; alis cyaneis. Fem

Long. corp. 8 lin. Alar. 14 lin.

Fem. Nigra, nitida. *Caput* angustum, de vertice antrorsùm declive, versus os conico-angustatum. *Antennæ* totæ testaceæ. *Os* nigro-villosum. *Trophi* mutilati. *Prothorax* latus, haud elongatus, nec angulatus ut

in *Planicipite.* *Pectus* nigro-villosum. *Pedes antici* breves, raptorii, coxis magnis: *femora* crassa, compressa, apice testacea. *Tibiæ* breves, nonnihil arcuatæ, testaceæ. *Tarsi* testacei, articulo primo lato compresso apice obliquè producto, articulis intermediis brevissimis pari modo productis quasi digitatis. *Pedes posteriores* mediocres, coxis magnis, femoribus crassis, tibiis haud serrulatis, sed subtilitèr spinulosis. *Alæ* cyaneæ, nervuris ut in *Pompilo Heroë,* &c. dispositis. *Abdomen* glabrum, chalybeo-micans.

A single specimen of this remarkable insect was taken at Cape Gregory, Straits of Magellan, which I have the pleasure of dedicating to Captain P. P. King.

As this insect partakes of the characters of both *Pompilus* and *Planiceps,* I have not ventured to refer it to either. It seems more nearly allied to the former, from which the raptorious fore legs would be scarcely sufficient to distinguish it without the peculiar head. The trophi are unluckily lost; but there are great variations of them within the limits of the genus *Pompilus* as at present constituted.

*43. Scolia quadrimaculata. *Fabr.*

The male, which seems to have been unknown to Fabricius, has a yellow spot on the basal joint of the abdomen, which has a chalybeous tint; and the 2nd, 3rd, and sometimes the 4th segment are margined with yellow, uniting the lateral spots, which are smaller and paler than those of the female.

Rio de Janeiro.

44. Scolia argentea, *n. s.*

Nigra; abdomine argentato. Fem.

Long. corp. 9½ lin. Alar. 17 lin.

Fem. Nigra, brevitèr hirta. *Caput* et *thorax* vagè punctata; *metathorax* sublævis. *Pedum calcaria* nigra. *Alæ* lutescentes. *Abdomen* argentatum, incisuris albido-ciliatis.

St. Paul's.

45. Myrmecodes scoliæformis, *n. s.*

Niger; vittâ frontali et antennis testaceis. Fem.

Long. corp. 9 lin.

Fem. Animalculum apterum *Proscarabæi* magnitudine; *Scoliæ* statura, sed thorace angustiore et medio coarctato. *Oculi* minutissimi. *Antennæ* teretes, convolutæ. *Abdominis segmenta* 2 *antica* coriacea. Niger, obscurus, subtùs præsertim pallido-pubescens. *Vitta* testacea, frontem transcurrens, oculos includit. *Antennæ* ferrugineæ, scapo nigro argenteo-barbato. *Tibiarum spinulæ* et *tarsorum setæ* rufo-piceæ.

Chili.

*46. Myrmosa dimidiata, *n. s.*

Atra; abdomine rufo; alis cyaneis. Mas.

Long. corp. 13½ lin. Alar. 24.

Mas. Atra, villosa, antennis et pedibus concoloribus. *Antennæ* capitis et thoracis longitudine, articulis exterioribus curvatis, unde apex antennarum undulatus evadit. *Alæ* castaneæ, cyaneo-micantes. *Abdomen* thorace ferè duplò longius, badium, nitidum, dorso ferè glabrum.

It is possible this may be the *Scolia rufiventris* of Fabricius, of which there is no figure. It was taken by Lieut. Graves in Chili.

*47. Mutilla derasa. *Fabr.*

Rio de Janeiro.

*48. Labidus Latreillii. *Jurine.*

Taken at St. Paul's by Lieut. Graves.

49. Atta Hystrix. *Latr.*

Gorrite.

*50. Atta quadriglumis, *n. s.*

Nigra, obscura; ano rufo; occipite et metathorace bispinosis. Aculeata.

Long. corp. 5 lin. Aculeata.

Insectum singulare nec *Atta* genuina ob antennas et ungues difformes. Nigra, obscura, sparsìm villosa, tarsis piceis. *Antennæ* solitò crassiores, articulis valdè distinctis, secundo intra primum ferè retracto. *Caput* ovatum, occipite bispini. *Frons* lineâ longitudinali impressa. *Oculi* minutissimi, punctiformes, fulgidi. *Mandibulæ* trigonæ, decurvæ. *Palpi* nulli. *Metathorax* bispinosus. *Segmentum petiolare* primum gibbum, lateribus compressum, basi subtùs mucrone tenui ferrugineo instructum; secundum

nodosum, basi infernè subtilitèr retrocuspidatum; segmentum tertium, campanulatum, abdominis tres partes occupans. *Anus* ferrugineus, manifestè aculeatus. *Pedes* longi, validiusculi, calcaria numero 1 : 2 : 2, parium posteriorum tenuissima, subulata. *Ungues* bidentes.

Taken at Rio de Janeiro and also at St. Catherine's by Lieut. Graves.

This species cannot be referred without violence to any of the established genera of Ants; but I am not sufficiently acquainted with the family to attempt characterizing the group to which it belongs.

51. Myrmica ——— ?

Species minutissima, *Polistis* collum mordicus amplexa, nec discriminis certioris habilis.

52. Ponera tarsata. *Fabr.*

St. Catherine's.

53. Formica strenua, *n. s.*

Glabra, ferruginea; abdomine fusco; antennis subclavatis. Aculeata.

Long. corp. 1¾ lin.

Corpus nitidum, glabrum. *Thoracis dorsum* medio depressum.

Port Famine.

54. Formica castanea. *Latr.*

St. Catherine's.

55. Formica maculata. *Fabr.*

St. Catherine's.

HYMENOPTERA.

Stirps. Pupivora.
Fam. Ichneumonidæ.
Trib. Genuinæ.
Gen. *Ichneumon.*
Subg. *Ichneumon.*
1. xanthorrhæus.
2. plebeius.
3. patricius.
Gen. *Cryptus.*
Subg. *Phygadeuon.*
4. prælatus.
Subg. *Trachysphyrus.*
5. imperialis.
Subg. *Cryptus.*

6. bellicosus.
Gen. *Pimpla.*
Subg. *Pimpla.*
7. Sponsa.
Gen. *Ophion.*
Subg. *Campoplex.*
8. fugitivus.
Subg. *Ophion.*
9. luteus. *Linn.*
Fam. EVANIIDÆ.
Gen. *Evania.*
10. lævigata. *Latr.*
Stirps. TUBULIFERA.
Fam. CHRYSIDÆ.
Gen. *Chrysis.*
11. cœrulans. *Fabr.*
Stirps. MELLIFERA.
Fam. APIDÆ.
Trib. SOLITARIÆ.
Sect. ANDRENOIDEÆ.
Gen. *Xylocopa.*
12. Morio. *Fabr.*
Sect. DASYGASTRES.
Gen. *Megachile.*
13. susurrans.
14. squalens.
Gen. *Cœlioxys.*
15. prætextata.
Sect. SCOPULIPEDES.
Gen. *Ancylosceles.*
16. ursinus.
Trib. SOCIALES.
Gen. *Melipona.*
17. favosa. *Fabr.*
18. ruficrus. *Latr.*
Gen. *Trigona.*
19. Amalthea. *Fabr.*
Gen. *Bombus.*
20. Cajennensis. *Fabr.*
21. nigripes.
Fam. ANDRENIDÆ.
Gen. *Halictus.*
22. rubellus.
23. metallicus. *Fabr.*
Gen. *Andrena.*
24. cyanescens.
Gen. *Colletes.*
26. occidentalis.
Stirps. DIPLOPTERA.
Fam. VESPIDÆ.
Trib. SOCIALES.
Gen. *Polistes.*
Subg. *Epipone.*
27. cyanea. *Fabr.*
Subg. *Polistes.*
28. ignobilis.
29. multipictus.
30. biguttatus.
31. apicalis. *Fabr.*
32. Actæon.
Trib. SOLITARIÆ.
Gen. *Odynerus.*
33. vespiformis.
34. labiatus.
35. humeralis.
Gen. *Eumenes.*
Subg. *Dicœlius.*
36. Merula.

Stirps. FOSSORIA.

Fam. SPHEGIDÆ.

Gen. *Sphex.*

37. Latreillii. *St. Farg.*

Fam. POMPILIDÆ.

Gen. *Pompilus.*

38. Gravesii.

39. bilunatus.

40. ferruginipennis.

Subg. *Pepsis.*

41. Heros. *Fabr.*

Subg. *Chirodamus.*

42. Kingii.

Fam. SCOLIADÆ.

Gen. *Scolia.*

43. quadrimaculata. *Fabr.*

44. argentea.

Gen. *Myrmecodes.*

45. scoliæformis.

Stirps. HETEROGYNA.

Fam. MUTILLIDÆ.

Gen. *Myrmosa.*

46. dimidiata.

Gen. *Mutilla.*

47. derasa. *Fabr.*

Fam. DORYLIDÆ.

Gen. *Labidus.*

48. Latreillii. *Jur.*

Fam. FORMICIDÆ.

Gen. *Atta.*

49. Hystrix. *Latr.*

50. quadriglumis.

Gen. *Myrmica.*

51. ———— ?

Gen. *Ponera.*

52. tarsata. *Fabr.*

Gen. *Formica.*

53. strenua.

54. castanea. *Latr.*

55. maculata. *Fabr.*

Descriptions, &c. of the

DIPTERA.

By FRANCIS WALKER, *Esq., F.L.S., &c.*

1. CULEX MOLESTUS.

CULICI pipienti *similis at validior, illo quoque et* Culicibus *plerisque pedibus brevioribus et paullò crassioribus discrepans.*

Culex molestus. *Kollar, Brasiliens verzüglich lästige Insecten, p.* 18. *fig.* 13.

Corp. long. 2 lin. Alar. 3¾ lin.

Fem. *Caput* fuscum: *oculi* obscuri: *antennæ* obscurè fuscæ, pilosæ: *os* fuscum: *labium* flavum: *pectus* flavescens: *thorax* obscurè fuscus; *vittæ* vix

conspicuæ: *abdomen* fuscum; *segmenta* basi sordidè flava: *pedes* pallidè fusci, pubescentes; *coxæ* et *femora* flava: *alæ* hyalinæ, iridescentes, ciliatæ, costam versus flavescentes; *nervi* pallidè fusci, pilosi, ad costam obscuriores: *halteres* flavi, apice fusci.

Taken at Monte Video in Brazil, where it abounds, and is called the Mosquitto by the inhabitants.

*2. Chironomus antarcticus, *n. s.*

Mas et fem. *Canus, thorace maculato, abdomine nigro, pedibus obscurè flavis, alis albo-hyalinis.*

Corp. long. $2\frac{1}{4}$—$2\frac{1}{2}$ lin. Alar. $3\frac{3}{4}$—4 lin.

Caput canum: *oculi* nigri: *antennæ* nigro-fuscæ: *os* fuscum: *thorax* canus, maculis 3 nigris, mediâ antepositâ; *pectus* nigrum, nitidum: *abdomen* nigrum, pubescens; *segmenta* apice fusca, *mari* ferè nigra: *mari pedes* pallidè flavi, pilosi; *fem.* obscurè flavi, pubescentes; *tarsi* fusci: *alæ* albo-hyalinæ, iridescentes; *punctum* solitum fuscum; *nervi* costales fusci, benè determinati; cæteri vix conspicui: *halteres* obscurè flavi.

Taken at Port Famine in the Straits of Magellan.

3. Chironomus lateralis, *n. s.*

Mas. *Ater, thoracis lateribus anticè rufis, pedibus nigro-fuscis, alis subfuscis.*

Corp. long. 1—$1\frac{1}{6}$ lin. Alar. $1\frac{3}{4}$—2 lin.

Ater, nitidus: *antennæ* nigræ: *os* fuscum: *thorax* utrinque anticè rufus: *abdomen* nigrum, obscurum, pubescens: *pedes* nigro-fusci, pubescentes: *alæ* subfuscæ, iridescentes; *nervi* fusci, optimè determinati: *halteres* albi.

Taken at Port Famine in the Straits of Magellan.

*4. Gonomyia? antarctica, *n. s.*

Mas et fem. *Fusca, obscura, thorace utrinque maculato, pedibus basi flavis, alis subhyalinis.*

Corp. long. $2\frac{1}{2}$—3 lin. Alar. $6\frac{1}{2}$ lin.

Gonomyiâ non benè convenit; *alarum nervi* nonnulli dissimiles: *caput* fuscum: *antennæ* nigro-fuscæ, pilosæ: *thorax* griseus, fusco trivittatus; *vitta* media lata; *vittæ* laterales angustiores, breviores: *abdomen* sordidè fusco-

fulvum, obscurum, pubescens: *pedes* fusci, parcè pubescentes; *femora* basi et *trochanteres* fusca: *alæ* subhyalinæ; *macula* subcostalis apicem versus fusca; *nervi* fusci; *nervuli* transversi fusco limbati: *halteres* flavi.

Taken at Port Famine in the Straits of Magellan.

5. Gonomyia? variegata, *n. s.*

Fem. *Flava, thorace brunneo vittato, abdomine fusco fasciato, alis hyalinis.*

Corp. long. $2\frac{1}{2}$ lin. Alar. 6 lin.

Caput et *pedes* adempta: *thorax* flavus, suprà castaneus flavo 4-vittatus; *vittæ* laterales latiores: *abdomen* flavum; *segmenta* supra basi flava, apice fusca: *oviductus* flavus: *alæ* hyalinæ, iridescentes; *macula* cuique apicem versus parva subcostalis; *nervi* fusci; *nervuli* transversi fusco sublimbati: *halteres* flavi.

Taken at St. Paul in Brazil.

6. Tipula gracilipes, *n. s.*

Fem. *Fusco-ferruginea*, T. vittatæ *similis, pedes graciliores.*

Corp. long. 8 lin. Alar. 16 lin.

Fusco-ferruginea, obscura, parcè pubescens: *caput* ferrugineum, anticè nitens, ante oculos suprà albicans: *oculi* nigri: *palpi* fusci: *antennæ* fuscæ, nudæ; *articuli* 1*us* et 2*us* omninò sequentesque apice fulvi: *thorax* fusco-ferrugineus, posticè subtùs et utrinque fulvus: *abdomen* fuscum, subtùs fulvum; *segmenta* apice fulva, 1um et 2um fulvo latè fasciata, illum basi utrinque nigrum: *oviductus* fulvus, nitens: *pedes* fusci, pubescentes, graciles; *coxæ, trochanteres, femora* basi et *genua* fulva; *tarsi* longissimi, intorti: *alæ* fuscæ, iridescentes, ad costam obscuriores; *maculæ* in disco 4 subhyalinæ et totidem obscurè fuscæ, *vittæ*que nonnullæ hyalinæ indistinctæ; *nervi* nigro-fusci: *halteres* fusci.

Taken at St. Paul in Brazil.

7. Tipula pictipennis, *n. s.*

Fem. *Cana, thorace vittis brunneis, abdomine fulvo maculis nigris, pedibus fuscis, alis variegatis.*

Corp. long. $8\frac{1}{2}$ lin. Alar. 16 lin.

Cana, obscura, parcè pubescens: *caput* brunneo vittatum: *oculi* nigri: *palpi* nigro-fusci: *antennæ* concolores, pilosæ; *articulus 2us* flavus: *thorax* suprà ante alas brunneo quadri-vittatus, inter alas quadri-maculatus, post alas uni-vittatus; *vittæ dorsales* angustæ; *maculæ laterales* parvæ: *abdomen* obscurè fulvum; *vitta dorsalis segmento* omni *macula*que utrinque nigræ: *oviductus* castaneus, nitidus: *pedes* fusci, pubescentes; *coxæ* canæ; *femora* fulva, basi et ante apices flava, apice nigra; *tibiæ* apice nigræ: *alæ* hyalinæ, iridescentes, maculis fasciisque plurimis fuscis; *costa alæ*que disco *macula* flavæ: *halteres* fusci, apice obscuriores, basi fulvi.

Taken at Port Famine in the Straits of Magellan.

8. Sciophila antarctica, *n. s.*

Mas. *Fusca, abdomine nigro-fusco incisuris pallidis, pedibus flavis, alis subhyalinis.*

Corp. long. 1½ lin. Alar. 3 lin.

(Div. C. Meigen.) *Sciophilæ hirtæ* affinis. Fusca: *oculi* et *palpi* nigri: *antennæ* fuscæ, basi flavæ: *abdomen* nigro-fuscum; *incisuræ* pallidæ: *pedes* flavi; *tarsi* fusci: *alæ* subhyalinæ, immaculatæ, iridescentes; *nervi* fusci: *halteres* flavi, apice fusci.

Taken at Port Famine in the Straits of Magellan.

9. Leia nubilipennis, *n. s.*

Nigra, thorace utrinque fulvo, abdomine fulvescente, pedibus flavis, alis subhyalinis.

Corp. long. 1½ lin. Alar. 3 lin.

(Div. B. b. Meigen.) *Caput* et *mesopedes* adempta: *thorax* niger, nitidus, anticè utrinque fulvus: *abdomen* nigrum, obscurum, pubescens; *discus* obscurè fulvus: *pedes* flavi; *coxæ* apice, *tibiæ tarsi*que fusca: *metatibiæ* spinosæ: *alæ* subhyalinæ, iridescentes, maculis plurimis magnis sed indistinctis fuscis; *nervi* fusci: *halteres* straminei.

Taken at Port Famine in the Straits of Magellan.

10. Platyura? insolita, *n. s.*

Mas. *Nigra, thorace fulvo vittato, pedibus fuscis, femoribus flavis, alis hyalinis fusco maculatis.*

Corp. long. $2\frac{1}{2}$ lin. Alar. $4\frac{1}{2}$ lin.

Platyuris Europæ plerisque non convenit; *nervus* transversus apicalis multò longior, subarcuatus, alæ apicem ferè attingens. *P. tipuloide* sat benè quadrat: *caput* nigrum, obscurum: *os* flavescens: *antennæ* nigræ; *articuli* 1*us* et 2*us* flavi: *thorax* niger, nitidus, fulvo quadri-vittatus; *vittæ* utrinque anticè connexæ; *scutellum* fuscum, pilosum: *abdomen* nigrum, pubescens, obscurum; *apex* et *incisuræ* fusca: *pedes* flavi; *tibiæ* fuscæ, parcè spinosæ; *tarsi* nigro-fusci: *alæ* hyalinæ, iridescentes, fasciis 2 fuscis, una media curvata, altera apicalis latior, ambæ ad costam obscuriores; *nervi* nigro-fusci: *halteres* pallidè flavi, apice pallidè fusci.

Taken in Chili.

11. *N. G.*

Corp. long. $2\frac{2}{3}$ lin.? Alar. $5\frac{1}{4}$ lin.

Novi generis specimen unicum cui caput et abdomen adempta, *Leiæ* similis, sed propter costam impressam et nervos subcostales *Penthetriæ* affinis: *nervorum* dispositio propria: *thorax* fulvus, vittis 3 latis badiis: *abdomen* fuscum? *pedes* fulvi, inermes; *tarsorum articuli* apice fusci: *alæ* hyalinæ, iridescentes; *vittæ* media et apicalis subfuscæ, hæc lata, illa curvata; *maculæ* ad costam 2 sat magnæ et sub costam totidem minores fuscæ; *cellula discoidalis* magna, longa, completa; *nervi* fusci: *halteres* straminei.

Taken at Port Famine in the Straits of Magellan.

*12. Plecia collaris.

Mas et fem. *Atra, thorace rufo, pedibus nigro-brunneis, alis subfuscis.*

Hirtea collaris. *Fabr. Syst. Antl.* 54. 12.

Plecia collaris. *Wied. Dipt. Exot.* i. 32. 3.; *Aussereurop. Zweifl.* i. 74. 3.

Corp. long. $1\frac{3}{4}$—$2\frac{3}{4}$ lin. Alar. $3\frac{1}{2}$—$5\frac{1}{2}$ lin.

Caput nigrum, obscurum: *antennæ* nigræ; *articulus* 2*us* rufescens: *os* nigrum: *thorax* rufus, nitidus, glaber, tristriatus, anticè ater, posticè fuscus; *striæ* griseæ: *abdomen* nigrum, obscurum, pubescens: *pedes* nigro-brunnei,

densè pubescentes: *alæ* subfuscæ; *costa* saturatior; *nervi* fusco sublimbati: *halteres* rufo-fusci, apice nigri.

Taken at St. Paul and at Rio Janeiro in Brazil.

*13. Plecia maura, *n. s.*

Mas et fem. *Omninò atra, alis fuscis.*

Corp. long. 4—5 lin. Alar. 8—10 lin.

Atra, obscura, *P. funebri* similis at multò major: *oculi* nigro-fusci: *thorax* tristriatus: *abdomen* pubescens: *pedes* pubescentes: *alæ* fuscæ; *costa* saturatior; *nervi* fusco limbati.

An abundant species; many were taken at St. Catherine, in Brazil, by Lieut. T. Graves, R.N.

14. Bibio antarctica, *n. s.*

Fem. *Atra, thorace rufo maculato, pedibus fuscis, femoribus flavis, alis hyalinis.*

Corp. long. 2 lin. Alar. 4 lin.

Caput nigrum, obscurum: *thorax* ater, nitidus, anticè rufo bifasciatus; *vittæ* in disco 4 rufæ posticè connexæ: *abdomen* nigrum, obscurum, pubescens: *pedes* fusci, pubescentes; *femora* flava, nitida, apice basique fusca: *alæ* hyalinæ, iridescentes; *macula* ad costam oblonga, fusca; *nervi costales* fusci; cæteri pallidè flavi: *halteres* fulvi, apice nigro-fusci.

Taken at Port Famine in the Straits of Magellan.

*15. Tabanus latus.

Fem. *Ater; thorax subtùs anticè et utrinque abdominisque apex pilis rufis hirti.*

Tabanus latus. *Guérin, Iconographie de Règne Animal, Insectes, pl.* 77. *fig.* 1.

Corp. long. 7 lin. Alar. 13 lin.

Corpus nigro-griseum, obscurum, pubescens: *caput* subtùs anticè et utrinque pilis rufis hirtum: *oculi* nigro-fusci: *ocelli* 3 distincti: *os* nigrum, thorace brevius: *antennæ* nigro-fuscæ, non furcatæ: *thorax* suprà utrinque pilis nigris, subtùs anticè et utrinque pilis rufis hirtus: *abdomen* nigrum, ferè lineare, apice paullò latius, nitidum, punctulatum; *puncta* quoque majora in ordinibus 2 utrinque collocata, præterquam segmento apicali

omni 4; segmentorum 3i, 4i et 5i latera nigro-hirta; 6um et 7um rufa, pilis concoloribus hirta: *pedes* nigri, pubescentes: *pulvilli* fusci: *alæ* subfuscæ, basi et ad costam obscuriores; *nervi* nigro-fusci, apice mutabiles; *squamæ* concolores; *squamulæ* nigræ: *halteres* fusci, apice nigri.

Many specimens of this fine species were taken at Conception, on the coast of Chili, by Lieut. T. Graves.

16. Pangonia cornuta, *n. s.*

Fem. *Rufa, abdomine flavo, alis subhyalinis.*

Corp. long. 4½ lin. Alar. 10 lin.

P. furcatæ affinis. *Caput* rufescens, subtùs anticè et utrinque niveum pilisque niveis ornatum: *oculi* æenei: *ocelli* non conspicui: *antennæ* rufæ; *articuli* 1us et 2us pilis nigris parcis hirti; *articuli* 3i furca basi exeuns longissima, apice pilosa; *articulus ultimus* quoque apice pilosus: *os* rufum, thorace brevius, apice nigrum et nitidum: *palpi* pilis albis, nonnullis quoque nigris et crassioribus hirti: *thorax* rufus, suprà griseo-pubescens, subtùs albo pubescens et pilosus: *abdomen* flavum, pilis concoloribus hirtum; *segmenta apicalia* suprà rufa et pilis nigris hirta: *pedes* rufi, nigro pubescentes; *pro-* et *mesotibiæ* albo pubescentes; *metatibiæ, tarsi, ungues* et *pulvilli* rufo-fusca: *alæ* subhyalinæ; *costa* et *nervi* flava, hi apice fusci; *squamulæ* et *squamæ* fuscæ: *halteres* flavi, apice straminei.

Taken at St. Paul in Brazil.

17. Tabanus varipes, *n. s.*

Mas. *Fuscus, vittatus, abdomine ferrugineo maculato, pedibus nigris fulvo cinctis, alis hyalinis.*

Corp. long. 5⅓ lin. Alar. 10½ lin.

Caput fuscum, lanugine densâ vestitum alba: *os* nigro-fuscum, pubescens, breve: *palpi* albidi: *oculi* nigro-æenei: *antennæ* nigræ, simplices; *articuli* 1us et 2us rufi: *thorax* fuscus, obsoletè trivittatus, obscurus, pilis suprà parcis subtùs et utrinque densis pallidè fuscis hirtus: *abdomen* ferrugineum, pilis flavis hirtum, suprà è maculis trigonis fulvis trivittatum, basi apice et medio fuscum: *pedes* nigri, pubescentes; *femora* apice *tibiæ*que nisi ad apices fulva: *pulvilli* fulvi: *alæ* hyalinæ, iridescentes; *costa* et

squamulæ fulva; *nervi* fusci, basi flavescentes; *squamæ* albæ: *halteres* flavi, apice albidi, ante apices fusco cingulati.

Taken at Gorrite.

18. Tabanus albohirtus, *n. s.*

Fœm. *Niger, ferrugineo variegatus, pedibus ferrugineis, alis hyalinis.*

Corp. long. 5 lin. Alar. $9\frac{2}{3}$ lin.

Caput ferrugineum, densè albo pubescens, subtùs pilis longioribus hirtum: *os* nigro-fuscum, breve: *palpi* albi: *antennæ* nigræ, simplices; *articuli* 1us et 2us lætè flavi; *oculi* ænei: *thorax* niger, griseo obsoletè 5-vittatus, albo suprà parcè subtùs densè pubescens; latera ferruginea; *abdomen* nigrum, albo pubescens, subtùs ferrugineum, apice nigro-fuscum; *segmenta* omnia apice necnon 1um, 2um et 3um utrinque ferruginea: *pedes* ferruginei, pubescentes; *femora* basi et *coxæ* nigra; *propedum tibiæ* apice *tarsi*que nigra: *alæ* hyalinæ, iridescentes; *squamulæ* fuscæ; *costa* et *nervi* flava, hi apice fusci; *squamæ* albæ: *halteres* flavi, apice albi.

Taken at Cape Gregory.

*19. Tabanus tritus, *n. s.*

Fœm. *Nigro-fuscus, griseo maculatus, pedibus nigro-fuscis, alis subhyalinis.*

Corp. long. 4 lin. Alar. $7\frac{3}{4}$ lin.

Nigro-fuscus, griseo pubescens: *caput* fuscum, pilis albidis densis hirtum: *os* breve; *palpi* fusci: *antennæ* nigræ; *articuli* 3us et sequentes adempti: *thorax* nigro-fuscus, griseo 5-vittatus, pilis griseo-fulvis hirtus: *abdomen* nigro-fuscum, suprà è maculis quadrifariàm trigonis griseis vittatum; *segmenta* apice cana: *pedes* nigro-fusci, pubescentes; *tibiæ* basi, *genua* et *pulvilli* fulva: *alæ* subhyalinæ, non iridescentes; *squamulæ* fuscæ; *nervi* nigro-fusci, basi pallidiores; *nervi transversi* fusco limbati; *squamæ* sordidè albidæ: *halteres* fusci; *clava* nigra, apice fusca.

Taken at Cape Gregory.

20. Xylophagus vittatus, *n. s.*

Mas. *Ater, capite thoraceque flavo maculatis, pedibus nigris, alis fuscis.*

Corp. long. $2\frac{1}{2}$ lin. Alar. 5 lin.

(Div. B. Meigen.) *Caput* nigrum, anticè et posticè flavo maculatum, subtùs

albo pubescens: *oculi* rufi: *antennæ* et *os* nigra: *thorax* ater, obscurus, supra flavo 4-vittatus, subtùs albo pubescens; *scutellum* flavum: *abdomen* nigrum, obscurum, pubescens: *pedes* nigri, pubescentes; *femora* et *tibiæ* nitida; *tarsi* subtùs pilis rufis hirti: *alæ* obscurè fuscæ, iridescentes, pubescentes, basi nigro-fuscæ; *costa, squamulæ* et *nervi* nigro-fusca; *squamæ* sordidè albidæ: *halteres* flavi, apice straminei.

Taken at St. Paul in Brazil.

*21. Midas notospilus.

Mas et fem. *Ater, thorace albo-maculato, abdomine rufo-cingulato, pedibus rufo-fuscis, alis fulvescentibus.*

Midas notospilus. *Wied. Aussereurop. Zweifl.* i. 244. 10.

Corp. long. 7 lin. Alar. $10\frac{1}{2}$ lin.

Caput nigrum, parùm nitens, pilis suprà albidis subtùs griseis hirtum: *oculi* nigro-fusci, subtùs albo marginati: *antennæ* nigræ, *mari* apice fuscæ, *fem.* apice rufo-fuscæ: *thorax* niger, obscurus, maculis utrinque 3 albis et 2 rufis ornatus: *abdomen* nigrum, nitidum, pubescens, basi utrinque albo maculatum; *segmenta* apice rufa: *mari* pedes obscurè rufi; *coxæ* omnes necnon *metapedum femora* et *tibiæ* suprà fusca: *fem.* pedes lætè rufi; *coxæ* fuscæ: *alæ* fulvescentes; *costa* saturatior; *squamulæ* rufo-fuscæ; *nervi* fulvi; *squamæ* flavescentes: *halteres* fusci, apice rufi.

Taken at Gorrite by Lieut. Graves.

*22. Anthrax erythrocephala.

Fem. *Nigra, capite rufo, abdomine cyaneo, alis nigris maculis nonnullis hyalinis.*

Stomoxys Morio. *Fabr. Ent. Syst.* iv. 393. 1.; *Syst. Antl.* 279. 1.

Anthrax erythrocephala. *Fabr. Syst. Antl.* 118. 4. *Wied. Dipt. Exot.* i. 1203.; *Aussereurop. Zweifl.* i. 256. 5.

Corp. long. $5\frac{1}{2}$ lin. Alar. 11 lin.

Caput lætè rufum: *oculi, antennæ* et *os* nigra: *thorax* niger, obscurus, pilis anticè et utrinque lætè rufis et post alæ basin utrinque albis hirtus: *abdomen* cyaneum, parùm nitens, subtùs nigrum; *latera* et *apex* pilis nigris hirta: *pedes* nigri, obscuri, pubescentes: *alæ* nigræ; *maculæ* 3 connexæ

fasciam abbreviatam margine porrectam postico fingentes; puncta 3 et apex hyalina; *squamulæ* et *squamæ* nigræ: *halteres* fusci.

Taken at Conception.

23. Asilus vetustus, *n. s.*

Mas. *Ferrugineo-griseus, abdomine rufo, pedibus nigris, alis subhyalinis.*

Corp. long. 11—12 lin. Alar. 18½—20 lin.

(Div. I. Wied.) *Caput* nigrum, pilis albis densissimis et subtùs longissimis hirtum: *oculi* nigro-fusci: *os* nigrum: *antennæ* nigræ: *articulus apicalis* s. 4us fuscus, apice albus: *thorax* griseus ferrugineo confusus, subtùs pilis albis densè hirtus; latera rufo-cana, pilis anticè nigris posticè albis spinisque nonnullis flavis et nigris hirta: *abdomen* rufum, albo parcè pubescens, apice setosum; *segmenta* 1um et 2um nigra, pilis utrinque et subtùs albis densisque hirta; *segmenta apicalia* nitida, glabra, supra nigra; *segmenta* 1o ad 4um ventralia cana, incisuris nigris: *pedes* nigri, pilis albis setisque nigris hirti; *pulvilli* rufo-fusci: *alæ* subhyalinæ; *squamulæ* et *nervi* fusca, hi basi rufi: *halteres* fulvi, apice fusci.

Taken at Gorrite.

24. Asilus macrotelus, *n. s.*

Mas. *Griseo ferrugineus, abdomine apice rufo, pedibus rufis, alis subhyalinis.*

Corp. long. 10¼—11. Alar. 15—15½ lin.

Caput obscurè rufum, anticè et subtùs pilis densis albis hirtum: *oculi* nigro-æneі: *os* fuscum: *antennæ* rufæ; *articulus apicalis* fuscus: *thorax* ferrugineo-fuscus, vittis 2 utrinque obliquis 3que rectis griseis; *latera* rufo-cana; *scutellum* griseum, apice ferrugineum: *abdomen* longum, angustum, apice setosum; *segmenta* 1o ad 5um ferruginea, pubescentia; sequentia rufa, nitida, glabra: *pedes* rufi, pubescentes, spinis nigris armati; *coxæ* canæ; *femora* rufo-fusca; *tarsi* nigro-fusci; *ungues* nigri; *pulvilli* fulvi: *alæ* subhyalinæ; *squamulæ* et *nervi* fusca, hi fulvo sublimbati; *nervus costalis* nigro-fuscus: *halteres* fulvi.

Taken at Gorrite.

*25. Asilus mucidus, *n. s.*

Mas. *Fuscus, abdomine subtùs albo, pedibus rufis, alis hyalinis.*

Corp. long. 7 lin. Alar. 12 lin.

Caput nigrum, pilis anticè et subtùs densis albis necnon anticè nigris et parcis hirtum: *oculi* æneo-rufi: *antennæ* nigræ; *articuli* 3us et sequentes adempti: *os* nigrum: *thorax* nigro-fuscus, albo pubescens, suprà albo trivittatus; *latera* cana: *abdomen* fuscum, pilis albis densè hirtum, subtus album; *vitta dorsalis* nigro-fusca, glabra: *pedes* rufi, pilis albis spinisque nigris hirti; *femora* et *tibiæ* suprà nigro vittata; *ungues* nigri; *pulvilli* fulvi: *alæ* hyalinæ; *squamulæ* fuscæ; *nervi* nigro-fusci, basi fusci, ad costam nigri: *halteres* fulvi.

Taken at Port St. Elena in December by Lieut. Graves.

26. Empis antarctica, *n. s.*

Mas et fem. E. pennariæ *similis; pedes vix pubescentes.*

Corp. long. $1\frac{1}{4}$—$1\frac{3}{4}$ lin. Alar. 3—$3\frac{1}{2}$ lin.

(Div. A. Meigen.) Grisea, unicolor: *oculi* rufi: *antennæ* et *os* nigra: *pedes* rufo-fusci, vix pubescentes; *mari* protarsi articulo 1o dilatato: *alæ* hyalinæ, iridescentes; *costa* flavescens; *squamulæ* rufæ; *nervi* et *halteres* fulvi.

Taken at Port Famine in the Straits of Magellan.

27. Empis fulva, *n. s.*

Fulva, thorace suprà fusco, pedibus fulvis, alis subhyalinis.

Corp. long. $2\frac{1}{2}$ lin. Alar. 5 lin.

Fulva, flavo variegata, parcè pilosa: *oculi* fusci: *os* flavum, apice nigrum: *antennæ* rufæ: *thoracis discus* fuscus: *pedes* fulvi, vix pubescentes; *coxæ* fuscæ: *alæ* subhyalinæ; *nervi* fulvi, ad costam flavi flavoque limbati: *halteres* fulvi.

Taken at Port Famine in the Straits of Magellan.

*28. Cyphomyia costalis, *n. s.*

Fem. *Nigra, abdomine fulvo, pedibus rufis, alis flavo-hyalinis.*

Corp. long. 4 lin. Alar. 8 lin.

Caput nigrum, aureo pilosum, anticè flavo varium: *oculi* nigro-fusci, flavo-

cingulati: *antennæ* nigræ; *articulus* 1us flavus, apice niger; 3us et sequentes adempti: *thorax* niger, aureo pubescens, utrinque ad alæ basin viridis: *abdomen* fulvum; *segmenta ventralia* nigra, apice fulva: *pedes* pallidè rufi, argenteo pubescentes; *coxæ* et *femora* fusca, hæ apice rufa: *alæ* flavo-hyalinæ, iridescentes; *costa* et *nervi* flava, illa alæ apicem versus fusca: *halteres* rufi, apice virides.

Taken at St. Paul in Brazil.

29. Paragus ? scutellaris, *n. s.*

Fem. *Nigro-viridis, scutello abdominisque segmentis* 1o, 3o *et* 4o *flavo maculatis, pedibus nigris rufo variis, alis hyalinis.*

Corp. long. 3⅔ lin. Alar. 6 lin.

Bacchæ propter abdomen basi angustum et compressum similis, et eâ de causâ *Parago* differt: *caput* nigro-cyaneum, nitens, glabrum, utrinque anticè album: *oculi* æneo-rufi, posticè lanugine alba marginati: *antennæ* rufo-fuscæ: *thorax* nigro-viridis, obscurus; scutellum flavo circumdatum: *abdomen* atro-violaceum, nitens; *segmenta* primum, tertium et quartum utrinque flavo maculata: *pedes* nigri; *femora* et *metatibiæ* apice basique rufa; *pro-* et *mesotibiæ* rufæ, apice fuscæ; *tarsi* fusci; *metatarsi* nigri: *alæ* hyalinæ, iridescentes; *squamulæ, nervi* et *costa* nisi ad apicem fusca: *halteres* rufi.

Taken at St. Paul in Brazil.

30. Baccha inornata, *n. s.*

Mas. *Nigro-ænea, capite fulvo, abdomine fulvo maculato, pedibus flavis, alis fuscis.*

Corp. long. 3¼ lin. Alar. 5⅓ lin.

Nitens, glabra: *caput* fulvum, anticè flavum: *oculi* rufi: *antennæ* fulvæ: *thorax* nigro-æneus, apice et subtùs fulvus: *abdomen* nigro-æneum; *segmenta* basi utrinque et subtùs fulva: *pedes* flavi; *metafemora* apices versus fusco cingulata; *metatarsi* pallidè fusci: *alæ* fuscæ, iridescentes: *costa* obscurior; *nervi, squamæ* et *halteres* fusca.

31. Pipiza costalis, *n. s.*

Fem. *Atra, pedibus rufis nigro et fusco variis, alis subhyalinis.*

Corp. long. 2½ lin. Alar. 5 lin.

Atra, suprà obscura, subtùs nitida: *caput* chalybeum, anticè utrinque argenteo micans: *oculi* rufi, lanugine albâ circumdati: *antennæ* rufæ: *abdomen* pubescens: *pedes* rufi; *coxæ* et *femora* nigra, hæ apice rufa; *pro-* et *mesotibiæ* apice obscuriores; *metatibiæ* fuscæ, basi rufæ; *tarsi* apice fusci: *alæ* subhyalinæ, apice fusco maculatæ; *squamulæ* nigræ; *costa* nigro-fusca; *nervi* fusci: *halteres* rufi.

32. Pipiza longicornis, *n. s.*

Mas et fem. *Chalybea,* mari *abdomine æneo-fusco;* fem. *flavo maculato, pedibus fulvis fusco variis, alis subfuscis.*

Corp. long. 2½—2¾ lin. Alar. 4¾—5 lin.

Mas. *Caput* chalybeo-æneum, anticè utrinque albo micans: *oculi* rufi, albo circumdati: *antennæ* rufæ, capite vix longiores; *articulus* 3us fuscus: *thorax* chalybeo-viridis, nitens, glaber, suprà obsoletè vittatus: *abdomen* æneo-fuscum, nitens, sericeum, apice chalybeum, subtùs fuscum lateribus et apice viridi-æneis; *segmentum* 3um suprà utrinque stramineo maculatum: *pedes* fulvi; *coxæ, metafemora* nisi ad basin, *metatibiæ tarsi*que apice omnes fusca: *alæ* subfuscæ, apice et per costam obscuriores; *squamulæ* et *nervi* fusca; *nervi* transversi fusco limbati: *halteres* fulvi.

Fem. *Caput* chalybeum: *thorax* chalybeus, suprà distinctè vittatus: *abdomen* chalybeum, sericeum, subtùs concolor; *segmentum* 3um utrinque flavo maculatum: *coxæ* et *metafemora* fusca, hæ basi fulva.

33. Pipiza sericea, *n. s.*

Mas. *Atro-chalybea, pedibus fuscis, alis hyalinis.*

Corp. long. 3¾ lin. Alar. 6 lin.

Caput chalybeum, anticè album: *oculi* rufi, posticè lanugine albâ circumdati: *antennæ* rufæ: *thorax* ater, nitens; *latera* pilis albis hirta; *scutellum* rufo-fuscum: *abdomen* atrum, holosericeum, subtùs chalybeum; *segmenta* apice basique violaceo nitentia; *latera* albo pubescentia: *pedes* rufo-fusci; *coxæ* et *metapedes* obscurè fusca: *alæ* hyalinæ, iridescentes; *nervi* fusci, ad costam pallidiores: *halteres* fusci, apice nigro-fusci.

Var. β. *Thorax* omninò chalybeus.

34. Syrphus 8-maculatus, *n. s.*

Fem. *Niger, scutello abdominique fasciis* 4 *interruptis flavis, pedibus fulvis basi nigris, alis hyalinis.*

Corp. long. $4\frac{1}{2}$ lin. Alar. 8 lin.

Syrpho Ribesii similis: *caput* nigrum, nitidum, anticè fuscum: *antennæ* et *oculi* fusca: *os* nigrum: *thorax* nigro-æneus, fulvo-pubescens; *scutellum* flavum: *abdomen* obscurum, nigrum, thorace latius, planum, maculis suprà utrinque 4 latis flavis, basi utrinque fulvo pubescens, subtùs flavum: *pedes* fulvi; *coxæ, trochanteres* et *femora* basi nigra; *tarsi* suprà pallidè fusci: *alæ* subhyalinæ, iridescentes; *nervi* et *squamulæ* fusca, illi basi pallidiores; *costa* flavescens: *halteres* flavi.

Taken in Chili.

*35. Helophilus chilensis, *n. s.*

Mas et fem. *Fuscus, thorace fulvo vittato, abdomine atro flavo maculato, pedibus rufis, alis subhyalinis.*

Corp. long. $4\frac{2}{3}$ lin. Alar. $7\frac{3}{4}$ lin.

Caput fuscum, flavo pubescens, anticè et suprà fulvum, hic quoque pilis nigris hirtum: *oculi* æneo-rufi: *antennæ* nigro-fuscæ: *os* plerumque concolor: *thorax* nigro-fuscus, fulvo 4-vittatus, pilis flavis hirtus; *scutellum* fulvum: *abdomen* atrum, obscurum, pilis flavis et apice nigris hirtum, subtùs fulvum, maculis suprà utrinque *mari* 3 flavis et apicem versus 1 sordidè albo, *fem.* 4 pallidè flavis: *pedes* rufi, pilis flavis et griseis hirti; *coxæ* fuscæ: *alæ* subhyalinæ, iridescentes, ad costam obscuriores; *squamulæ* fuscæ; *nervi* nigri, basi fusci; *halteres* flavi.

Taken in Chili; and Mr. Curtis has received it from Edward Bennett, Esq., who took it in Chiloe.

36. Syrphus unicolor, *n. s.*

Chalybeo-ater, pedibus rufis nigro variegatis, alis hyalinis.

Corp. long. 2 lin. Alar. $4\frac{1}{2}$ lin.

Chalybeo-ater, nitens, parcè pubescens: *caput* albido-chalybeum: *oculi* rufo-fusci: *antennæ* fuscæ: *pedes* rufi, pubescentes; *coxæ, pro-* et *mesofemora*

basi et *metapedes* nigra: *alæ* hyalinæ, iridescentes; *squamulæ* fuscæ; *costa* apicem versus obscurior; *nervi* nigri, basi fusci: *halteres* fusci.

Taken at Port Famine in the Straits of Magellan.

37. Syrphus basalis, *n. s.*

Chalybeus, scutello apice fulvo, abdomine æneo-fusco, pedibus flavis fusco maculatis, alis hyalinis.

Corp. long. 2½ lin. Alar. 5 lin.

Caput chalybeum, anticè flavum: *oculi* rufo-fusci: *antennæ* fuscæ: *thorax* chalybeus, utrinque fulvo pubescens; *scutellum* apice fulvum: *abdomen* æneo-fuscum, utrinque fulvo pubescens, apice nigro-æneum: *pedes* flavi, pubescentes; *femorum apices* suprà nigro-æneo maculati; *metapedum, femora tibiæ*que fusco-ænea apice basique flava, *tarsi* fusci: *alæ* hyalinæ, iridescentes; *squamulæ* et *nervi* fusca; *costa alæ* apicem versus obscurior: *halteres* flavi.

Taken at St. Paul in Brazil.

38. Syrphus iridipennis, *n. s.*

Mas. *Æneus, abdomine fusco-chalybeo, pedibus rufis fusco cingulatis, alis fuscis.*

Corp. long. 3½ lin. Alar. 7½ lin.

Syrpho obscuro similis: æneus, fulvo parcè pubescens: *caput* nigrum, anticè albidum: *oculi* rufo-fusci, posticè lanugine albâ circumdati: *antennæ* fuscæ: *thorax* obscurè æneus, suprà violaceo univittatus, subtùs chalybeus; *scutellum* lætè æneum: *abdomen* fuscum, chalybeo nitens: *pedes* obscurè rufi; *femora* fusco cingulata; *metapedum femora tibiæ*que fusca, illa apice basique rufa: *alæ* obscurè fuscæ, iridescentes; *nervi* nigro-fusci; *squamulæ* et *halteres* fusca.

39. Syrphus tarsalis, *n. s.*

Chalybeus, thorace æneo-atro, pedibus fuscis, metatarsis albis, alis hyalinis anticè nigro-fuscis.

Corp. long. 5 lin. Alar. 8½ lin.

Syrpho dimidiato similis: *caput* ademptum: *thorax* æneo-ater, obscurus, subtùs chalybeus et nitens; *latera* albo-pilosa: *abdomen* chalybeum, nitens, gracile, lineare, utrinque albo-pilosum: *pedes* fusci; *genua* rufa; *metatarsi* albi, articulus basalis fuscus: *alæ* nigro-fuscæ, iridescentes; *margo posticus* et *apex* hyalini; *nervi* nigro-fusci: *halteres* rufi.

*40. Syrphus tibicen.

Fem. *Chalybeus, scutello et abdomine flavo maculatis, pedibus fulvis fusco variegatis, alis subhyalinis.*

Syrphus tibicen. *Wied. Aussereurop. Zweifl.* ii. 127.

Corp. long. 4 lin. Alar. 8 lin.

Caput chalybeum, nitens, anticè album, posticè æneum: *oculi* æneo-fusci, lanugine flavâ posticè cingulati: *antennæ* fuscæ: *thorax* chalybeo-æneus, chalybeo per medium flavo utrinque vittatus, subtùs chalybeus; *scutellum* apice et utrinque flavum: *abdomen* atro-chalybeum, obscurum, subtùs pallidius; *segmenta* apice chalybeo-ænea; 1um utrinque flavum, 2um flavo fasciatum, 3um, 4um et 5um maculâ utrinque arcuatâ et vittâ per medium angustâ flavis; maculæ subtùs non benè determinatæ: *pedes* fulvi; *tarsi* nigro-fusci, basi rufi; *metapedum femora* et *tibiæ* fusca, basi fulva: *alæ* subhyalinæ, iridescentes; *costa* apicem versus obscurior; *nervi* nigro-fusci; *squamulæ* et *halteres* flava.

Rather abundant at St. Paul's, Brazil.

*41. Ornidia obesa.

Mas. *Lætè viridis, purpureo cyaneoque micans, pedibus nigro-purpureis, alis subhyalinis.*

Syrphus obesus. *Fab. Syst. Ent.* 763. 5.; *Ent. Syst.* iv. 282. 15.; *Syst. Antl.* 227. 14.

Volucella obesa. *Wied. Aussereurop. Zweifl.* ii. 199. 8.

Ornidia obesa. *St. Farg. et Sevr. Encycl. Méthod.* x. 786.

Corp. long. 4½ lin. Alar. 9½ lin.

Lætè viridis, nigro pubescens: *caput* anticè et posticè cyaneum: *oculi* æneo-fusci, pubescentes: *antennæ* rufo-fuscæ: *thorax* cyaneo purpureo cupreoque micans; *scutellum* purpureum, apice cyaneum: *abdomen* viride, cya-

neo purpureoque micans: *pedes* nigro-purpurei, pubescentes; *femora* viridi nitentia: *alæ* subhyalinæ, maculis 2 nigro-fuscis; una alæ medio magna, altera apicem versus parva; *costa* flavescens: *nervi* et *squamæ* fusca; *squamulæ* ciliatæ: *halteres* albi.

Taken at Rio Janeiro in Brazil.

*42. Eristalis lateralis, *n. s.*

Mas. *Fuscus, scutello flavo, abdomine nigro-æneo flavo maculato, pedibus nigro-fuscis, alis hyalinis.*

Corp. long. $3\frac{1}{2}$ lin. Alar. $5\frac{1}{4}$ lin.

Caput nigrum, pilis griseo-fulvis hirtum, anticè fulvum: *oculi* æneo-fusci: *os* nigrum: *antennæ* rufo-fuscæ: *thorax* fuscus, pilis fulvis hirtus, subtùs niger; *scutellum* flavum: *abdomen* nigro-æneum, subnitens, pilis nigris flavisque hirtum, subtùs flavum, apice nigrum; *segmenta* apice flava, 2um et 3um utrinque latè flava, penultimum basi chalybeum: *pedes* nigri, pubescentes; *femora* apice flava; *tibiæ tarsi*que fusca, illæ basi flavæ: *alæ* hyalinæ; *nervi* nigro-fusci, basi fusci; *squamulæ* fuscæ; *squamæ* albidæ, flavo ciliatæ: *halteres* flavi.

Taken in Chili.

43. Chiromyza vittata.

Fem. *Fulva, fusco maculata, pedibus rufis, alis fulvo-fuscis.*

Chiromyza vittata. *Wied. Aussereurop. Zweifl.* i. 237. 1.

Corp. long. 5 lin. Alar. 10 lin.

Fulva, pubescens: *oculi* æneo-fusci: *antennæ* rufo-fuscæ, apice nigro-fuscæ: *thorax* subtùs fusco maculatus; *discus* fuscus, fulvo bivittatus: *abdomen* obscurè fuscum; *segmentum* 1um fulvum, apice fuscum: *pedes* obscurè rufi, pubescentes; *coxæ* et *trochanteres* fulva; *femora* fusca, apice basique rufa: *alæ* fulvo-fuscæ; *costa* saturatior; *nervi* fulvo-fusci, fusco sublimbati; *squamulæ* fulvæ: *halteres* fusci.

Taken at Rio Janeiro in Brazil.

44. Medeterus antarcticus, *n. s.*

Fem. *Viridi-fuscus, pedibus flavis, tarsis fuscis, alis subfuscis.*

Corp. long. $1\frac{1}{4}$ lin. Alar. 3 lin.

Viridi-fuscus, obscurus, pilosus: *oculi* rufo-fusci: *antennæ* fuscæ; *articulus* ultimus præcedentibus duplò longior: *thorax* suprà vittis 2 angustis albidis, subtùs omninò albidum: *pedes* flavi, subæquales; *coxæ* et *tarsi* fusca; *tibiæ* spinosæ: *alæ* subfuscæ, iridescentes; *costa* saturatior; *nervi* fusci; *nervus* transversus ordinarius fusco limbatus; *squamulæ* fuscæ: *halteres* fulvi.

Taken at Port Famine in the Straits of Magellan.

*45. Psilopus equestris.

Fem. *Viridis, cyaneo varius, pedibus flavo-fuscis, alis hyalinis, fusco fasciatis.*

Musca equestris. *Fabr. Syst. Ent.* 782. 50.; *Ent. Syst.* iv. 340. 119.

Dolichopus equestris. *Fabr. Syst. Antl.* 268. 7.

Psilopus equestris. *Wied. Aussereurop. Zweifl.* ii. 214. 3.

Corp. long. $2\frac{3}{4}$ lin. Alar. $5\frac{1}{2}$ lin.

Lætè viridis, setosus: *caput* cyaneum, anticè argenteum: *oculi* rufi: *os* fulvum: *antennæ* nigræ; *articulus* ultimus longissimus: *thorax* sericeus, utrinque et subtùs argenteus: *abdomen* nitens, basi sericeum, apice cyaneum: *pedes* flavi, longi, pubescentes; *tibiæ* fulvæ, spinosæ; *tarsi* nigro-fusci: *alæ* hyalinæ, iridescentes; *costa* flavescens; *nervi* nigro-fusci; *fasciæ* 2 trans alæ medium irregulares anticè connexæ, fuscæ; *fascia* apicalis lata et ferè ad alæ apicem producta; *squamulæ* fuscæ: *halteres* flavi.

Taken at St. Paul's in Brazil.

46. Stomoxys humeralis, *n. s.*

Nigro-grisea, thorace rufo cano fuscoque vario, scutello apice rufo, pedibus fulvis, tarsis nigro-fuscis, alis griseo-hyalinis.

Corp. long. 5 lin. Alar. 10 lin.

Nigro-grisea, setis nigris sparsis armata: *caput* griseum, anticè pilis flavis hirtum: *os* nigro-fuscum: *oculi* et *antennæ* rufa: *thorax* cano fuscoque varius, anticè utrinque rufus; *scutellum* apice rufum: *abdomen* pubescens: *pedes* fulvi, pubescentes, spinis nigris armati; *tarsi* nigro-fusci; *pulvilli* fulvi; *ungues* nigri: *alæ* griseo-hyalinæ; *costa* pubescens; *nervi*

nigro-fusci, fusco sublimbati, basi rufi; *squamulæ* rufæ; *squamæ* sordidè albæ, flavo ciliatæ: *halteres* flavi.

Taken at Conception.

47. Tachina inornata, *n. s.*

Atra, thoracis vittis abdominisque lateribus fusco-canis, tibiis rufis, alis hyalinis.

Corp. long. 4½ lin. Alar. 9 lin.

Atra, pilis spinisque atris hirta: *caput* anticè sordidè albidum et sericeum: *oculi* rufi: *antennæ* et *os* fusca: *thorax* suprà fusco-cano 5-vittatus: *abdomen* utrinque fusco-canum: *pedes* nigri, pubescentes, spinosi; *trochanteres* fusci; *tibiæ* rufæ; *tarsi* apice et *pulvilli* rufescentes; *ungues* fusci: *alæ* hyalinæ; *costa* basi fuscescens; *nervi* fusci, basi fulvi; *nervus* costalis obscurior, ciliatus; *squamulæ* fuscæ; *squamæ* albidæ, flavo ciliatæ: *halteres* rufi.

Taken at Cape Gregory.

48. Tachina nervosa, *n. s.*

Nigro-grisea, thoraci vittis 5 *abdomineque canis, hôc fusco vario, tibiis rufis, alis subhyalinis.*

Corp. long. 3¾—4½ lin. Alar. 7½—9 lin.

Nigro-grisea, pubescens, spinosa: *caput* nigrum, anticè argenteum, subtùs pilis flavis hirtum: *oculi* rufi, lanugine albâ cingulati: *os* fuscum: *antennæ* nigro-fuscæ: *thorax* suprà cano 5-vittatus: *vitta* media indistincta: *abdomen* argenteo-canum, fusco varium: *pedes* nigro-grisei, pubescentes, spinosi; *tibiæ* obscurè rufæ; *pulvilli* rufi; *ungues* nigri: *alæ* subhyalinæ; *costa* obscurior; *nervi* fusci, strenui, fusco limbati, basi fulvi; *squamulæ* fuscæ; *squamæ* albidæ, flavo ciliatæ: *halteres* rufi.

Taken at Port Famine in the Straits of Magellan.

*49. Tachina pyrrhopyga.

Chalybea, abdomine utrinque et apice rufo, pedibus nigris, alis subhyalinis.

Tachina pyrrhopyga. *Wied. Aussereurop. Zweifl.* ii. 319. 69.; *Zool. Mag.* iii. 53. 19.

Corp. long. $3\frac{1}{4}$—$3\frac{3}{4}$ lin. Alar. $6\frac{1}{3}$—7 lin.

Chalybea, pilis spinisque nigris hirta: *caput* suprà anticè albidum, posticè pilis albis hirtum: *oculi* rufi: *os* fuscum: *antennæ* nigræ: *thorax* nigro-chalybeus, *vittis* suprà 5 albidis; *vittæ* media et externæ latæ; *scutellum* apice rufescens: *abdominis segmenta* utrinque rufo et albido micantia; *apex* rufus: *pedes* nigri, pubescentes, spinosi; *femora* et *tibiæ* subtùs albo micantia: *alæ* subhyalinæ, iridescentes; *costa* fusca; *nervi* nigro-fusci, fusco limbati; *squamulæ* nigro-fuscæ; *squamæ* albidæ, flavo marginatæ et ciliatæ: *halteres* fusci.

Taken at St. Catherine's.

50. TACHINA PICEIVENTRIS, *n. s.*

Cana, thorace nigro vittato, scutello apice rufo, abdomine plerumque fusco, pedibus nigris, alis hyalinis.

Corp. long. $2\frac{3}{4}$ lin. Alar. $5\frac{1}{2}$ lin.

Cana, pilis spinisque nigris hirta: *hypostoma* nigrum: *oculi* rufo-fusci: *antennæ* et *os* fusca: *thorax* suprà nigro tri-vittatus, subtùs cano nigroque varius; *scutellum* apice rufum: *abdomen* fuscum; *segmenta* 1o ad 3um maculis 3 magnis trigonis canis: *pedes* nigri, pilosi; *pulvilli* rufo-fusci: *alæ* hyalinæ, iridescentes; *nervi* nigro-fusci, basi rufo-fusci; *squamulæ* fuscæ; *squamæ* albæ: *halteres* rufi.

51. TACHINA TRIFASCIATA, *n. s.*

Albida, thoracis vittis abdominisque apice nigris, pedibus nigris, alis hyalinis.

Corp. long. $2\frac{3}{4}$ lin. Alar. $5\frac{1}{2}$ lin.

Tachinæ incultæ similis: *pilis* nigris hirta: *caput* argenteum, suprà flavescens: *oculi* et *os* rufa: *antennæ* nigræ: *thorax* flavo-albidus vittis 4 angustis nigris, subtùs albidus: *abdomen* nigrum; *segmenta* 2um, 3um et 4um alba, apice nigra: *pedes* nigri, pilosi: *coxæ* et *femora* subtùs alba; *pulvilli* rufi: *alæ* hyalinæ, iridescentes, ad costam subfuscæ; *nervi* et *squamulæ* fusca; *squamæ* albidæ: *halteres* rufi.

52. TACHINA ALBIFRONS, *n. s.*

Fulva, thoracis vittis abdomineque obscuris, hóc fasciato, pedibus nigris, alis hyalinis.

Corp. long. 2¼ lin. Alar. 4½ lin.

Fulva, pilis nigris hirta: *frons* argentea: *oculi* rufo-fusci: *os* rufescens: *antennæ* nigræ: *thoracis dorso vittæ* 4 nigræ angustæ; *scutellum* rufescens: *abdomen* nigro-fuscum, subtùs rufo-fuscum; *segmenta* 2um, 3um et 4um flavo-albido anticè fasciata; *fasciæ* interruptæ et utrinque posticè incisæ: *pedes* nigri, pilosi; *pulvilli* fusci: *alæ* hyalinæ, iridescentes; *costa* basi obscurior; *squamulæ* et *nervi* fusca; *squamæ* albidæ: *halteres* rufi.

53. TACHINA CHRYSOCEPHALA, *n. s.*

Cana, capite mesothoracis scuto abdominisque apice flavis, pedibus nigris, alis subhyalinis.

Corp. long. 2¼ lin. Alar. 4½ lin.

Cana, pilis nigris hirta: *caput* aureo-flavum; *frons* flavo-albida: *oculi* rufi: *os* nigro-fuscum: *antennæ* nigræ: *mesothoracis scutum* aureo-flavum, suprà nigro 4-vittatum; *vittæ* mediæ angustæ, externis utrinque posticè connexæ: *abdomen* nigro varium; *segmentum* basale suprà atrum, apicale aureo-flavum: *pedes* nigri, pilosi; *coxæ* et *femora* subtùs cana; *pulvilli* fusci: *alæ* griseo-hyalinæ, iridescentes; *nervi* nigro-fusci, basi pallidiores; *squamulæ* fuscæ; *squamæ* griseo-albidæ: *halteres* rufescentes.

54. TACHINA BASALIS, *n. s.*

Cana, thoracis vittis nigris, abdominis segmentis basi argenteis, pedibus nigris, alis griseis.

Corp. long. 2 lin. Alar. 4 lin.

Cana, pilis nigris hirta: *caput* nigrum, anticè canum: *oculi* et *os* fusca: *antennæ* nigræ: *thorax* nigro 4-vittatus?; *vittæ* indistinctæ: *abdomen* griseum; *segmenta* basi argentea: *pedes* nigri, pilosi; *pulvilli* fusci: *alæ* griseæ, iridescentes; *squamulæ* et *nervi* fusca; *squamæ* albidæ: *halteres* rufescentes.

Taken at Port Famine in the Straits of Magellan.

55. Tachina maura, *n. s.*

Nigra, parùm nitida, antennis nigro-fuscis, pedibus nigris, alis griseo-hyalinis.

Corp. long. 1½ lin. Alar. 3 lin.

Nigra, pilosa, obscura: *oculi* rufo-fusci: *os* fuscum: *antennæ* nigro-fuscæ: *abdominis segmenta* basi utrinque grisea: *pedes* nigri, pilosi; *pulvilli* fusci: *alæ* griseo-hyalinæ, iridescentes; *squamulæ* fuscæ; *nervi* nigro-fusci, basi pallidiores; *squamæ* griseo-albæ: *halteres* obscuri.

Taken at Port Famine in the Straits of Magellan.

56. Sarcophaga lateralis, *n. s.*

Cana, thorace nigro vittato, abdomine utrinque et subtùs fulvo, tibiis rufis, alis subfuscis.

Corp. long. 4½ lin. Alar. 9½ lin.

Cana, pilis nigris hirta: *caput* griseum, anticè flavo-albidum, subtùs flavo pubescens: *oculi* rufo-fusci: *os* fuscum: *antennæ* rufæ; *articulus* 3us apice fuscus: *thorax* suprà nigro 4-vittatus; *scutellum* rufo-fuscum: *abdomen* fulvum, albido micans; *vitta* dorsalis nigra, anticè dilatata: *pedes* nigri, pilosi; *femora* subtùs grisea; *tibiæ* obscurè rufæ, apice basique nigræ; *pulvilli* fusci: *alæ* subfuscæ; *costa* basi obscurior; *squamulæ* rufo-fuscæ; *nervi* nigro-fusci, fusco sublimbati, basi rufo-fusci; *squamæ* griseo-albidæ, flavo marginatæ: *halteres* rufi.

Taken at St. Paul's in Brazil.

*57. Sarcophaga plinthopyga.

Cana, capite aureo-flavo, abdomine apice croceo, pedibus nigris, alis griseis.

Sarcophaga plinthopyga. *Wied. Aussereurop. Zweifl.* ii. 360. 10.

Corp. long. 4½ lin. Alar. 9 lin.

Cana, pilis nigris hirta: *caput* aureo-flavum, suprà nigrum, anticè album, posticè canum: *oculi* rufi: *os* fuscum: *antennæ* nigræ: *thorax* nigro suprà obsoletè trivittatus: *abdomen* argenteo-griseum, nigro varium; *segmentum* apicale croceum: *pedes* nigri, pilosi; *coxæ* et *femora* subtùs gri-

sea: *pulvilli* fusci: *alæ* griseæ; *costa* basi obscurior; *nervi* et *squamulæ* nigro-fusca; *squamæ* griseo-albidæ: *halteres* rufi.

Taken at St. Catherine's.

58. Sarcophaga chlorogaster.

Fusca, thorace cano vittato, scutello apice rufo, abdomine cyaneo-viridi, pedibus nigris, alis griseo-hyalinis.

Sarcophaga chlorogaster. *Wied. Aussereurop. Zweifl.* ii. 359. 9.

Corp. long. $4\frac{1}{2}$ lin. Alar. 9 lin.

Fusca, pilis nigris hirta: *caput* canum, anticè flavo-album: *oculi* rufo-fusci: *antennæ* et *os* fusca: *thorax* suprà cano 4-vittatus; *scutellum* apice rufum: *abdomen* cyaneo-viride, nitens: *pedes* nigri, pilosi; *pulvilli* rufi: *alæ* griseo-hyalinæ, basi costam versus flavescentes; *nervi* et *squamulæ* fusca, illi basi rufi; *squamæ* albidæ: *halteres* flavi.

Taken at Port Famine in the Straits of Magellan.

59. Sarcophaga vittata, *n. s.*

Aureo-flava, subtùs cana, thorace nigro-vittato, abdomine cano, pedibus nigris, alis griseis.

Corp. long. 3 lin. Alar. $5\frac{1}{2}$ lin.

Aureo-flava, pilis nigris hirta: *caput* subtùs canum; *frons* et *hypostoma* nigra: *oculi* rufi: *os* fuscum: *antennæ* nigro-fuscæ: *thorax* suprà nigro 5-vittatus, subtùs canus; *scutellum* nigrum, apice et utrinque flavum: *abdomen* canum, suprà nigro tessellatum: *pedes* nigri, pilosi; *coxæ* et *femora* subtùs cana; *pulvilli* fusci: *alæ* griseæ, ad costam flavescentes; *squamulæ* fuscæ; *nervi* nigro-fusci; *squamæ* albidæ: *halteres* rufi.

60. Sarcophaga varia, *n. s.*

Flava, thorace nigro vittato, abdomine nigro maculis pallidis, pedibus nigris, alis griseo-hyalinis.

Corp. long. $2\frac{1}{2}$—3 lin. Alar. 5—6 lin.

Flava, pilis nigris hirta: *caput* sericeum, posticè canum; *hypostoma* nigrum; *frons* grisea: *oculi* rufo-fusci: *antennæ* et *os* nigro-fusca: *thorax* suprà

nigro 5-vittatus, subtùs canus; *scutellum* nigrum, utrinque flavum: *abdomen* nigrum, suprà è maculis flavis aut albidis 4-vittatum, subtùs apice flavo maculatum: *pedes* nigri, pilosi; *coxæ* et *femora* subtùs cana; *pulvilli* fusci: *alæ* griseo-hyalinæ, costam versus basi flavescentes; *squamulæ* et *nervi* fusca; *squamæ* albidæ: *halteres* rufescentes.

Taken at Gorrite, and at Port Famine in the Straits of Magellan.

61. Sarcophaga nigrocyanea, *n. s.*

Nigro-grisea, thorace cano vittato, abdomine nigro-cyaneo, pedibus nigris, alis griseo-hyalinis.

Corp. long. 3 lin. Alar. 6 lin.

Nigro-grisea, pilosa: *oculi* rufi: *os* fuscum: *antennæ* nigræ: *thorax* suprà cano 4-vittatus: *abdomen* nigro-cyaneum, griseo varium: *pedes* nigri, pilosi; *pulvilli* fusci: *alæ* griseo-hyalinæ, subiridescentes ad costam fuscæ; *nervi* et *squamulæ* fusca, illi fusco sublimbati; *squamæ* griseæ, flavo marginatæ: *halteres* rufi.

Taken in Chili.

62. Sarcophaga lambens.

Cana, thoracis vittis fuscis, abdominis apice aureo-flavo, pedibus fusco-canis, tarsis nigris, alis hyalinis.

Sarcophaga lambens. *Wied. Aussereurop. Zweifl.* ii. 365. 23.

Corp. long. $2\frac{2}{3}$ lin. Alar. $5\frac{1}{3}$ lin.

Cana, pilis nigris hirta: *caput* anticè utrinque et circum oculos aureo-flavum: *oculi* rufo-fusci: *os* fuscum: *antennæ* nigræ: *mesothoracis scutum* fusco trivittatum: *abdomen* apice aureo-flavum: *pedes* fusco-cani, pilosi; *tarsi* nigri; *pulvilli* fusci: *alæ* hyalinæ, iridescentes; *squamulæ* flavæ; *nervi* et *halteres* fusci; *squamæ* albæ.

Taken at St. Paul's in Brazil.

63. Musca Chilensis, *n. s.*

Viridis, thoracis vittis canis, abdomine femoribusque cyaneis, pedibus nigris, alis griseis.

Corp. long. 6 lin. Alar. 10 lin.

Viridis, pilis nigris hirta: *caput* nigrum, anticè canum: *oculi* rufo-fusci: *os* nigro-fuscum: *antennæ* nigræ: *mesothoracis scutum* suprà cano 4-vittatum: *abdomen* cyaneum, nitens, purpureo micans: *pedes* nigri, pilosi; *femora* cyanea; *pulvilli* fusci: *alæ* griseæ, basi obscuriores; *nervi* et *squamulæ* nigro-fusca: *squamæ* griseæ, albo marginatæ: *halteres* fusci.

Taken in Chili.

64. Musca purpurascens, *n. s.*

Purpureo-cyanea, antennis rufo-fuscis, pedibus nigris, femoribus cyaneis, alis subhyalinis.

Corp. long. $3\frac{1}{3}$—$3\frac{2}{3}$ lin. Alar. 6—$6\frac{1}{2}$ lin.

Purpureo-cyanea, nitens, pilis nigris hirta: *caput* griseum, circum oculos album, anticè rufo-album: *oculi* rufo-fusci: *os* fuscum: *antennæ* rufo-fuscæ, basi nigræ: *pedes* nigri, pilosi; *femora* cyanea; *pulvilli* fusci: *alæ* subhyalinæ, iridescentes, basi et sub costam obscuriores; *nervi* et *squamulæ* nigro-fusca; *nervulus* transversus fusco limbatus; *squamæ* griseæ, fulvo marginatæ: *halteres* fusci.

Taken at St. Catherine's.

65. Musca ochricornis.

Cyaneo-viridis, capite fulvo, thorace nigro vittato, pedibus nigris, tibiis rufis, alis griseo-hyalinis.

Musca ochricornis. *Wied. Aussereurop. Zweifl.* ii. 408. 41.

Corp. long. 3 lin. Alar. 6 lin.

Cyaneo-viridis, pilis nigris hirta: *caput* fulvum, suprà et posticè nigrum: *oculi* rufo-fusci: *os* nigrum: *antennæ* pallidè rufæ: *mesothoracis scutum* vittis 3 latis nigris; *scutellum* cyaneum: *abdominis segmenta* apice utrinque purpurea: *pedes* nigri, pilosi; *tibiæ* obscurè rufæ; *pulvilli* fusci: *alæ* griseo-hyalinæ, iridescentes, basi subfuscæ; *squamulæ* nigro-fuscæ; *nervi* fusci; *squamæ* albidæ, stramineo marginatæ: *halteres* fusci.

Taken at St. Catherine's.

66. Musca tibialis, *n. s.*

Cano-grisea, abdomine griseo-fusco, pedibus nigris, tibiis rufis, alis griseo-hyalinis.

Corp. long. $2\frac{1}{2}$ lin. Alar. 5 lin.

Grisea, pilis nigris hirta: *caput* nigrum, anticè argenteum: *oculi* obscurè rufi: *os* nigrum: *antennæ* fuscæ; *articulus* 3us basi rufus: *mesothoracis scutum* cano 4-vittatum: *abdomen* griseo-fuscum; *segmenta* apice cana: *pedes* nigri, pilosi; *tibiæ* obscurè rufæ; *pulvilli* flavi: *alæ* griseo-hyalinæ, iridescentes, basi et costam versus subfulvæ; *nervi* et *squamulæ* nigro-fusca; *nervi* transversi fulvo limbati; *squamæ* griseæ, fulvo marginatæ: *halteres* fusci.

Taken at St. Catherine's.

67. Anthomyia chalybea.

Cyanea, capite anticè argenteo, antennis pedibusque nigris, alis griseo-hyalinis.

Anthomyia chalybea. *Wied. Aussereurop. Zweifl.* ii. 428. 15.

Corp. long. 3 lin. Alar. $5\frac{1}{2}$ lin.

Cyanea, nitens, pilis nigris hirta: *caput* nigrum, inter antennas et utrinque argenteum: *oculi* rufo-fusci: *antennæ* nigræ; *articulus* 4us simplex, basi pubescens: *pedes* nigri, pilosi; *pulvilli* fusci: *alæ* griseo-hyalinæ, iridescentes; *nervi* et *squamulæ* nigra; *squamæ* obscurè griseæ: *halteres* fusci.

Taken in Chili.

68. Anthomyia anthracina, *n. s.*

Nigra, obscura, abdomine nitido, alis griseo-hyalinis.

Corp. long. $2\frac{1}{2}$ lin. Alar. $4\frac{3}{4}$ lin.

Nigra, obscura, pilis nigris hirta: *oculi* rufo-fusci: *antennæ* nigræ; *articulus* 4us simplex, pubescens: *abdomen* nitidum, minimè cyanescens: *pedes* nigri, pilosi; *pulvilli* fusci: *alæ* griseo-hyalinæ, iridescentes; *nervi* et *squamulæ* nigra; *squamæ* griseæ: *halteres* fusci.

Taken at Port Famine in the Straits of Magellan.

69. Anthomyia cyanea, *n. s.*

Cyanea, antennis pedibusque nigris, alis griseo-hyalinis.

Corp. long. 2 lin. Alar. 4 lin.

Specimen non benè conservatum. Lætè cyanea, nitens, pilis nigris hirta: *oculi* rufo-fusci: *antennæ* nigræ; *articulus* 4us simplex, pubescens: *pedes*

nigri, pilosi; *pulvilli* fusci: *alæ* griseo-hyalinæ, iridescentes; *squamulæ* et *nervi* nigra; *squamæ* griseæ: *halteres* fusci.

Taken at Gorrite.

70. Anthomyia immaculata, *n. s.*

Fusco-grisea, capite anticè albo, alis griseo-hyalinis, ad costam subfuscis.

Corp. long. 1¾ lin. Alar. 3½ lin.

Fusco-grisea, obscura, pilis nigris hirta: *caput* sericeum, suprà fulvum, anticè album: *oculi* rufo-fusci: *antennæ* fuscæ; *articulus* 4us niger, simplex, basi pubescens: *pedes* pilosi; *pulvilli* albidi: *alæ* griseo-hyalinæ, iridescentes, ad costam subfuscæ; *squamulæ, nervi* et *halteres* fusca; *squamæ* flavæ.

Taken at Port Famine in the Straits of Magellan.

71. Lonchœa obscura, *n. s.*

Nigra, obscura, unicolor, alis griseo-hyalinis.

Corp. long. 1½ lin. Alar. 3¼ lin.

Nigra, obscura, pilis nigris hirta: *oculi* rufo-fusci: *antennæ* nigræ; *articulus* 4us pubescens: *pedes* pilosi; *pulvilli* fusci: *alæ* griseo-hyalinæ, iridescentes; *squamulæ* fuscæ; *nervi* nigri: *halteres* nigri.

Taken at Port Famine in the Straits of Magellan.

72. Tephritis 5-fasciata, *n. s.*

Fem. *Fulva, abdomine nigro, basi et fasciis flavis, pedibus flavis, femoribus et metatarsis nigris, alis nigro-brunneo fasciatis.*

Corp. long. 2¾ lin. Alar. 5 lin.

Fulva, nitens, pilis nigris hirta: *caput* suprà luteum, anticè albidum: *antennæ* ademptæ: *oculi* rufo-fusci: *thorax* fusco trivittatus; *metathorax* niger: *abdomen* nigrum, basi et fasciis suprà 4 flavis; *telum* nigrum, breve, apice fuscum: *pedes* flavi, pilosi; *coxæ* fuscæ; *femora* et *metatibiæ* nigra: *alæ* hyalinæ, iridescentes, fasciis 4 nigro-brunneis; *fascia* basalis latissima, exundans, punctis nonnullis varia; 2a medio ad 1am connexa, 3am et 4am anticè emittens angustas alæ apicem versus proclives; *squamulæ* fuscæ; *nervi* nigri: *halteres* flavi.

73. Tephritis mellea, *n. s.*

Fem. *Fulva, thoracis vittis abdominisque fasciis flavis, metathorace nigro bimaculato, alis flavo fasciatis.*

Corp. long. $2\frac{3}{4}$ lin. Alar. 5 lin.

Fulva, parùm nitens, pilis albis setisque nigris hirta: *caput* anticè flavum: *oculi* rufo-fusci: *antennæ* fulvæ; *articulus* 4us niger, basi fulvus: *thorax* pallidè flavus; *discus* fulvus, flavo trivittatus; *metathorax* utrinque nigro maculatus: *abdominis segmenta* apice pallidè flava; *telum* mediocre, apice fuscum: *pedes* flavescentes, pilis nigris hirti: *alæ* hyalinæ, iridescentes, basi anticè flavæ fusco maculisque 2 magnis variæ hyalinis; *fasciæ* 3 alæ apicem versus pallidè fuscæ; *squamulæ* et *nervi* flava: *halteres* fulvi.

Taken at St. Paul's in Brazil.

*74. Tephritis unicolor, *n. s.*

Fem. *Nigra, pedibus fulvis, femoribus nigris, alis griseo nebulosis fuscoque trimaculatis.*

Corp. long. $1\frac{1}{2}$ lin. Alar. 3 lin.

Nigra, obscura, pilis nigris albisque hirta: *caput* anticè et suprà fulvum: *oculi* rufo-fusci: *antennæ* fuscæ; *articulus* 4us niger, basi fuscus: *pedes* fulvi, pilis nigris hirti; *femora* nigra: *alæ* griseæ, iridescentes, maculis plurimis limpidis; *maculæ* quoque majores costales duæ et disco una fuscæ; *squamulæ* et *halteres* fusca; *nervi* nigri.

Taken at Port Famine in the Straits of Magellan; and Mr. Curtis has received a specimen from Purruchuca, where Mr. Mathews found six specimens in the blossoms of plants.

*75. Sciomyza bicolor, *n. s.*

Mas et fem. *Ferruginea, abdomine nigro-fusco, alis hyalinis ad costam subfulvis.*

Corp. long. $1\frac{3}{4}$—2 lin. Alar. $4\frac{1}{4}$—$4\frac{1}{2}$ lin.

Ferruginea, parùm nitens, pilis nigris hirta: *caput* rufum: *oculi* rufo-fusci: *antennæ* fuscæ, pilis nigris hirtæ; *articulus* 4us niger, pubescens, basi fuscus: *abdomen* nigrum, basi ferrugineum: *pedes* fulvi, pilosi; *profemora*

fusca; *ungues* nigri; *pulvilli* pallidi: *alæ* subhyalinæ, iridescentes, costam versus subfulvæ; *squamulæ* et *nervi* fulva: *halteres* ferruginei.

Var. β. *Femora* omnia fusca.

Var. γ. *Femora* omnia fulva.

Taken at Port Famine in the Straits of Magellan.

76. SCIOMYZA FULVIPENNIS, *n. s.*

Mas. *Fusco-ferruginea, abdomine obscuriore, alis fulvis.*

Corp. long. $1\frac{1}{2}$ lin. Alar. $3\frac{1}{2}$ lin.

Fusco-ferruginea, pilis nigris hirta: *caput* anticè flavum: *oculi* rufo-fusci: *os* fulvum: *antennæ* fuscæ, basi fulvæ; *articulus* 4us niger, pubescens: *abdomen* fuscum, apice ferrugineum: *pedes* fulvi, pilosi; *ungues* nigri; *pulvilli* albidi: *alæ* fulvæ; *squamulæ* et *nervi* obscuriora: *halteres* albidi.

Taken at Port Famine in the Straits of Magellan.

77. TETANOCERA COSTALIS, *n. s.*

Ferruginea, antennis pedibusque obscurioribus, alis hyalinis sub costam fulvis.

Corp. long. $2\frac{1}{4}$ lin. Alar. $4\frac{1}{4}$ lin.

Ferruginea, setis nigris armata: *caput* posticè et inter oculos albo sericeum, anticè pallidè flavum: *oculi* rufo-fusci: *antennæ* fuscæ; *articulus* 1us et 2us pilis nigris hirti; 3us niger, pubescens, basi fuscus: *thoracis latera* et *vittæ* 3 vix conspicuæ dorsales albo sericea: *abdomen* ademptum: *pedes* obscurè ferruginei, setis nigris armati; *ungues* nigri; *pulvilli* albidi: *alæ* griseo-hyalinæ iridescentes, sub costam fulvæ; *squamulæ* et *nervi* fulva; *nervi* transversi fusci: *halteres* fulvi.

Taken at Port Famine.

78. GYMNOPA NITIDA, *n. s.*

Atra, nitens, alis albis.

Corp. long. $\frac{3}{4}$ lin. Alar. $1\frac{3}{4}$ lin.

Atra, nitens, pilis nigris hirta: *oculi* rufo-fusci: *os* nigrum: *antennæ* nigræ; *articulus* 4us pubescens: *pedes* nigri, pilosi: *alæ* albæ, iridescentes; *squamulæ* et *nervi* flava: *halteres* fulvi.

Taken at St. Catherine's.

E. Jones del. M. Gauci lith.

Printed by C. Hullmandel.

XVI. *Description of a new Species of the Genus* Chameleon. *By Mr.* Samuel Stutchbury, *A.L.S., and Curator of the Bristol Philosophical Institution.*

Read January 21st, 1834.

Chameleon cristatus.

C. SUPERCILIARI occipitalique carinâ elevatâ et crenulatâ, caudæ anteriori parte dorsique apophysibus elongatis cristam dorsalem constituentibus: squamis ferè rotundis subæqualibus.

Tab. X.

This singular and beautiful Chameleon is of an ash grey colour, with a dark-coloured patch upon the anterior and superior part of the body, giving off inferiorly two or three bands; posterior part of the body marked with orange and dark-coloured reticulate lines; edge of the dorsal crest and tail spotted with the same dark colour. Head having the superciliary and occipital ridges much elevated and crenulated; spinous processes of the back and anterior part of the tail elongated, forming a dorsal crest; scales roundish, nearly equal.

	Ins.	Lines.
Length from the tip of the nose to the extremity of the tail .	9	3
Breadth from the anterior dorsal spinous process to the sternum	2	0
Length from the anterior portion of the intermaxillary bones to the posterior point of the occipital ridge . . .	1	9
Length from the nose to the centre of the orbital ridge . .	0	8
Length of the body	3	0
Crested portion of the tail	1	5
Rounded portion of the tail	2	9
Length of the spinous processes	0	8
Breadth from the body of the vertebræ to the sternum . .	1	2

Number of elongated spinous processes which support the crest are as follows: Dorsal 16; Caudal 8.

The striking peculiarity of this animal consists in its having a dorsal crest supported by the spinous processes of the vertebræ, by which character it approaches the Basilisks.

It accompanied several other interesting reptiles, among them specimens of Dr. Leach's *Chameleon dilepas,* and of the genus *Cæcilia,* &c. &c., from the banks of the River Gaboon in Western Equinoctial Africa, and liberally presented to the museum of the Bristol Institution by Messrs. King and Sons of that city.

Cæcilia squalostoma.

Animal cylindrical, of a dark olive colour, minutely marked with nearly confluent yellowish spots; rings or folds 140—144, about 12 of which near the tail do not quite surround the body. *Muzzle* prominent, with a slight protuberance situated about a line inferiorly and posteriorly to the nostrils. *Eyes* not evident. Length 16 inches; circumference 8 lines.

Should this prove to be distinct from *Cæcilia tentaculata,* I would propose for it the specific appellation of *squalostoma* as being characteristic.

Habitat. Gaboon, Africa.

XVII. *Observations on the Genus* Hosackia *and the American* Loti.

By George Bentham, *Esq., F.L.S.*

Read February 3rd, 1835.

In describing the *Hosackia bicolor* for the Botanical Register (vol. xv. tab. 1257), I relied chiefly as a generic character on the pinnate leaves, and the absence of the large foliaceous stipulæ so prominent in *Lotus*, the genus from which *Hosackia* was separated, and to which it appears nearest allied; and I added to the abovementioned species three other North American plants, which in this respect appeared to belong to *Hosackia* rather than to *Lotus*. This view of the genus has since been taken up by Dr. Hooker in his *Flora Boreali-Americana* and other works, although evidently with doubt as to some of the species. Upon a reexamination of the same and other species contained in the Horticultural Society's Californian collections or in my own herbarium, I am now induced to confine the circumscription of *Hosackia* to the umbellate species, and propose to consider the uniflorous ones as belonging to *Lotus*, of which they would form a separate section, which, with reference to the size of the flowers, might be called *Microlotus*. The two genera would then be characterized by the form of the flower; and the peculiarities observable in the organs of vegetation would again be reduced to their proper level, that of *subsidiary* not *essential* characters.

In the true *Hosackiæ* the claw of the vexillum is always at some distance from those of the other petals; the alæ adhere by their margins to the carina, and usually (if not always) spread at right angles from it; the carina is usually less rostrate than in *Lotus*, and the stigma more distinctly capitate. The latter character, however, is of little importance, being but one of degree; for all *Loti* have in fact a capitate stigma, in some species very visible to the naked eye, especially when examined young; in others so small that the style appears pointed without a very close examination. The stipulæ in *Hosackia*

are always at the base of the leaves, in some species small and scariose, in one large and foliaceous, but formed more like those of the *Viciœ* than of *Lotus*, and in all the species of the second division, as described below, so minute as to appear like a little black spot, and even that is observable only on the younger leaves of some species.

In *Microlotus* the flower does not present any essential differences from that of our European *Loti*. The leaves appear at first sight to be irregularly pinnate with from three to five (and never more) leaflets, without any trace of stipules; but if it be considered that the lowest of the leaflets often occupies the place of a stipule, and that the two lowest (where there are more than three) are never opposite to each other, the opinion is suggested that the two lowest leaflets where there are five, or one or two where there are four, are in fact of the same nature as the foliaceous stipules of the European *Loti*, only as it were petiolate, with their petioles adhering to the common petiole of the leaf. This explanation is not indeed strictly compatible with the structure of the leaf of *Lotus subpinnatus*, as figured in Hooker and Arnott's Botany of Captain Beechey's Voyage, tab. 8.; but in my specimens I do not find the petiole to be concave, and the two lower leaflets both proceed from the upper side or (with reference to a horizontal plane) from the *middle line* of the petiole, and at the base of the petiole the bundles of vessels proceeding from these leaflets appear to lie one on each side of that middle line. This point, however, is difficult to determine upon dried specimens, where the apparently unilateral direction of the leaflets is very remarkable.

I now proceed to resume the character of *Hosackia* according to the above view, adding a synopsis of all the species of *Hosackia* and *Microlotus* I am acquainted with.

Hosackia. *Dougl. Benth. in Bot. Reg. sub t.* 1257.

Calyx tubulosus vel subcampanulatus, 5-dentatus. *Vexilli* unguis à cæteris distans. *Alœ* vexillum subæquantes, patentes. *Carina* submutica. *Stylus* subrectus. *Stigma* capitatum. *Legumen* cylindraceum, apterum.

Herbœ Boreali-Americanæ, perennes ?. *Folia* impari-pinnata. *Stipulœ* scariosæ, minutissimæ vel foliolis difformes. *Pedunculi* axillares, umbellatim pluriflori, folio florali sæpiùs stipati.

§ 1. *Stipulæ foliaceæ vel scariosæ.*

1. H. BICOLOR (*Dougl.*), stipulis scariosis, pedunculis ebracteatis, dentibus calycinis brevissimis. *Bot. Reg. t.* 1257.

Lotus pinnatus. *Hook. Bot. Mag. t.* 2913.

Columbia river. *Douglas.*

2. H. CRASSIFOLIA, stipulis scariosis, pedunculis infra umbellam folio trifoliolato bracteatis, dentibus calycinis brevissimis.

Size and habit of *H. bicolor.* Leaflets broad, obovate, somewhat fleshy. Fowers blue? or purple?, rather smaller than in *H. bicolor.*

California. *Douglas.*

3. H. STIPULARIS, stipulis foliaceis latè semisagittatis, pedunculis infra umbellam folio trifoliolato bracteatis, dentibus calycinis tubo brevioribus.

Size and habit of *H. bicolor.* Stems and petioles hairy.

California. *Douglas.*

4. H. GRACILIS, glaberrima, foliolis inferioribus latè obovatis, stipulis amplis membranaceis, pedunculis apice folio trifoliolato bracteatis, calycibus subbilabiatis tubo dimidio brevioribus.

A much slenderer and smaller plant than *H. bicolor,* to which it has in other respects much resemblance. Flowers rather smaller, more slender, with longer alæ.

California. *Douglas.*

5. H. MEXICANA, subcanescens, foliolis omnibus oblongis linearibusve, stipulis parvis scariosis, pedunculis 1—2-floris apice folio trifoliato bracteatis, dentibus calycinis subulatis tubo brevioribus.

A slender plant like the last. Flowers smaller, with the alæ and vexillum broader, but in other respects those of a true *Hosackia.*

Communicated by G. J. Graham, Esq., who gathered it during his visit to the mining district of Tlalpuxahua.

§ 2. *Stipulæ minutæ nigrescentes, sæpè deciduæ.*

6. H. grandiflora, apice levitèr pubescens, foliis sub-7-foliolatis, pedunculis elongatis apice foliolo unico sessili bracteatis, dentibus calycinis tubo vix brevioribus.

Size and habit of *H. bicolor.* Young leaves and calyces pubescent. Stipules only observable in the very young leaves. Flowers larger than in *H. bicolor,* but the footstalks of the petioles are less distant than in the other species.

California. *Douglas.*

7. H. decumbens, adpressè pubescens, foliis 4—5-foliolatis, pedunculis folio subbrevioribus multifloris apice folio subtrifoliolato bracteatis, dentibus calycinis tubum æquantibus. *Benth. in Bot. Reg. sub t.* 1257. *Hooker, Fl. Bor. Amer. t.* 134.

Alæ but slightly adherent.

Columbia river. *Douglas.*

8. H. tomentosa (*Hook. & Arn. Bot. of Beech. Voy.* 137 ?), piloso-tomentosa, foliis 4—5-foliolatis, pedunculis brevissimis multifloris foliolo unico bracteatis, dentibus calycinis tubo brevioribus.

In the above-quoted work the bracts are described as similar to the leaves, which is not the case in the specimens before me; it is therefore doubtful whether it be in fact the same plant. The alæ in this and the two following species are as strongly adherent to the carina as in *H. crassifolia,* &c.

California. *Douglas.*

9. H. cytisoides, decumbens glabra vel apice subsericea, ramis angulatis, foliis 3—5-foliolatis, pedunculis multifloris foliolo minimo bracteatis, dentibus calycinis subulato-aristatis recurvis.

Leaves small, thick, with very short petioles. Stipules small and black, but hard and persistent in the form of tubercles. Flowers purple ?, rather smaller than in *H. decumbens.*

California. *Douglas.*

10. H. juncea, glabra, ramis angulatis strictis, foliis remotis 3—5-foliolatis,

pedunculis brevissimis plurifloris subebracteatis, dentibus calycinis brevibus muticis.

Branches very numerous and nearly erect. Leaves of *H. cytisoides*, with which this species has considerable affinity.

California. *Douglas.*

11. H. SERICEA, densè sericeo-tomentosa, foliis subtrifoliolatis, pedunculis brevissimis 1—3-floris ebracteatis.

Near *H. cytisoides*, but very distinct. Leaves larger, nearly sessile. Flowers rather larger. Alæ slightly but constantly adherent.

California. *Douglas.*

LOTUS. *Linn. Ser. in DeCand. Prodr.* 2.

SECT. III. MICROLOTUS. *Pedunculi* uniflori. *Folia* 3—5-foliolata exstipulata (stipulæ foliaceæ petiolares à caule remotæ ?).

Herbæ Americanæ annuæ. *Flores* parvi. *Corollæ* vix calycem excedentes.

1. L. SUBPINNATUS (*Lag. Gen. et Sp. Pl.* 23.) villosus, foliolis obovatis, pedunculis brevissimis ebracteatis, leguminibus villosis.

Lotus subpinnatus. *Hook. & Arn. Bot. of Beech. Voy.* 17. *t.* 8.

Anthyllis chilensis. *DeCand. Prodr.* ii. 171.

Chili. *Cuming, Bertero,* &c. California. *Douglas.*

Apparently a coast plant.

2. L. MACRÆI, subglaber, foliolis oblongis linearibusve, pedunculis brevissimis ebracteatis, leguminibus glabris.

Valparaiso (Chili). *Macrae.* Raised also in our gardens from seeds brought by Mr. Cuming.

3. L. MICRANTHUS, glaber, foliis sub-5-foliolatis, pedunculis elongatis apice bracteatis.

Hosackia parviflora. *Benth. in Bot. Reg. sub t.* 1257. *Hook. Fl. Bor. Amer.* i. 134.

Columbia river. *Douglas.* California. *Menzies.* (*Hooker.*)

4. L. sericeus (*Pursh, Fl. Amer. Sept.* ii. 489.), pubescens, foliis subtrifoliolatis, pedunculis elongatis apice bracteatis.

Trigonella americana. *Nutt. Gen.* ii. 120.

Hosackia Purshiana. *Benth. in Bot. Reg. sub t.* 1257.

Widely spread over North America from the North-west (*Douglas*), to the Rocky Mountains and South Carolina (*Torrey*).

5. L.? unifoliolatus, hirsutus, foliis unifoliolatis, pedunculis brevibus apice bracteatis.

Hosackia unifoliata. *Hook. Fl. Bor. Amer.* i. 135.

Columbia river. *Scouler.* (*Hooker.*)

I have not seen this plant; the above character is from Dr. Hooker's description.

XVIII. *Characters of* Embia, *a Genus of Insects allied to the White Ants* (Termites); *with Descriptions of the Species of which it is composed. By* J. O. Westwood, *Esq., F.L.S.*

Read March 4th, 1834.

THE extraordinary œconomy and destructive habits of the White Ants have attracted so great a share of the attention of naturalists, that every object with which they are allied is necessarily rendered worthy of observation. I need therefore offer but little apology for submitting to the Linnean Society the following descriptions of several singular insects possessing a very close affinity with the *Termites*, feeling convinced that this circumstance alone would render my paper acceptable, although unaccompanied (as our descriptions of exotic insects are unfortunately too often compelled to be) by any account of their habits and *modus vivendi*: moreover, the extreme rarity of the insects in question may be urged in support of their interest, since it is presumed that of the three exotic species of which the genus *Embia* is now composed a single specimen only of each has hitherto come under the observation of entomologists. Another interesting peculiarity arises from the fact that each of these three insects is from a different quarter of the globe, and is distinguished by characters of a higher rank than mere specific distinction, whence I have been under the necessity of considering each as a distinct subgenus. The singular form of the anterior tarsi and the white lines on the wings of all the species are also worthy of attention.

In the Annulose portion of the great national French work on Egypt, which, unfortunately for science, from the overwhelming number of microscopic observations therein exhibited, deprived the unfortunate Savigny of sight, we find two beautiful figures, accompanied by elaborate details of an insect bearing considerable resemblance to the *Termes*. In consequence, however, of the circumstances connected with the publication of the Entomological

portion of this work, no characters were given of the insects figured in it. In the *Familles Naturelles du Règne Animal*, 1825, we however find a second genus introduced into the family *Termitinœ* by Latreille, under the name of *Embia*, with the short observation, "Voisin du précédent (*Termes*) mais à antennes différentes*." In the 2nd edition of the *Règne Animal*† this second genus is referred to Savigny's insect, with the observation, "Des insectes des contrées méridionales de l'Europe et d'Afrique, analogues aux *Termès*; mais à tête plus large que le corselet, à tarses de trois articles, à ailes ne dépassant guère l'abdomen, ou nulles, ayant les pieds comprimés, les deux jambes antérieures plus larges, sans yeux lisses, et dont le corselet est alongé, forment le genre que j'ai indique sous le nom d'*Embie* (*Embia*); il est figuré dans le grand ouvrage sur l'Egypte."

I know not upon what authority Latreille here indicated Europe as the locality of this insect; it will be seen, however, that other species of the genus inhabit both Asia and South America: neither can I decide from what materials he was led to state that they are sometimes wingless, as in Savigny's figures they are represented with wings; from analogy, however, they may be fairly considered as occurring without these organs in those states in which the *Termites* are destitute of them. Moreover, in Savigny's figures and in the other species the head is neither larger nor broader than the thorax, and the posterior femora are as large as the anterior. No further account has been published of this genus; the subsequent description is consequently entirely drawn up from Savigny's figures, the accuracy of which no one will venture to doubt, and which I have added to my plate. Of the second species, a magnified figure was published in Mr. Griffith's English translation of the *Règne Animal* under the name of "*Embius? brasiliensis*, G. R. Gray," with the observation, "We insert a figure of a singular insect, which bears some similarity to the genus *Embia*, but differs in having the antennæ as long as the body, the thorax much longer and more separate from the head, which is rounded posteriorly, the terminal joints of the palpi rather larger; it therefore may be formed into a distinct subgenus, which Mr. Gray has named *Olyntha*. The species is from South America, therefore is named *brasiliensis*." Unfortunately no indication of the natural size of this insect was given; and the

* p. 437.

† Vol. v. p. 256, *note*.

details with which I had illustrated the figure in question (published from my drawing) remain unpublished. These, therefore, I have introduced into my Plate.

The third species has been unnoticed by entomologists; and it is to the liberality of W. W. Saunders, Esq., F.L.S., &c. (by whom it was captured in India,) that I am indebted for my specimen, which was the only one in his collection. When first examined the wings were matted upon the abdomen, and the insect had all the appearance of a small earwig: this similarity is not merely external, since the structure of the mouth is nearly identical.

Genus. EMBIA. *Latr.*

Character Generis.

Corpus elongatum
Thorax elongatus.
Alæ abdomine haud longiores.
Femora antica et postica dilatata.
Tarsorum anticorum articulus 1us dilatatus.

Descriptio Generis.

Corpus elongatum, depressum, æquè latum.

Caput ovatum, posticè paullò angustius, thoracis latitudine, depressum. *Oculi* lateralitèr antici, ovales, anticè subemarginati. *Ocelli* 0. *Antennæ* filiformes, ante oculos (in sinu) insertæ, longitudine variæ, articulis 11, 15 aut 32, basilari crassiori, 2do breviori, 3tio paullò longiori. *Labrum* breve, transversum, angulis anticis rotundatis, ciliatum, integrum, *clypeo* transversè affixum. *Mandibulæ* corneæ, mediocres, elongato-trigonæ, dentibus duobus aut tribus brevibus, acutis apicalibus. *Maxillæ* lobo externo galeiformi gracili, ad basin subarticulato, intùs subexcavato, lobo interno majori arcuato, apice acuto, bidentato, intùs ciliato. *Palpi maxillares* maxillis paullò longiores, filiformes, articulis 4 aut 5, articulis brevibus, ultimo paullò longiori, apice subacuminato. *Mentum* transverso-quadratum, coriaceum. *Labium* membranaceum, menti longitudine, apice quadrifidum, laciniis externis magnis, rotundatis, depressis, ciliatis, internis brevibus acutis. *Palpi labiales* breves, triarticulati, articulo ultimo longiori.

Thorax oblongus. *Prothorax* distinctus, lamellâ depressâ subquadratâ anticè angustiori supertectus. *Mesothorax* et *metathorax* subquadrati, singulo suprà lamellâ magnâ, scutelliformi, coriaceâ, depressâ, triangulari (posticè angustato) supertecto. *Sterna* elongata.

Alæ subæquales (anticæ paullò majores), subopacæ, longæ, angustæ, abdomen horizontalitèr incumbentes, et apicem ejus attingentes, nervis perpaucis, longitudinalibus, interdùm at rarè nervis transversis (locis irregularibus) connexis, vittis inter nervos longitudinales albis aut hyalinis, nervo subcostali incrassato, nervis duobus contiguis, et cum illo parallelis (uno antico, altero postico).

Abdomen elongatum, suprà planum, vel depressum, appendice brevi, styliformi, quasi articulatâ, ex utroque latere, anum versus, exeunti.

Pedes breves, femoribus anticis et posticis dilatatis, tibiis subcompressis, calcaribus obsoletis, tarsis 3-articulatis, articulo 1mo (in pari antico) dilatato, clypeato, articulo 2do omnium brevissimo.

Sexûs differentia latet.

Genus, quoàd affinitates, *Termites* cum *Eustheniâ* Westw. inter *Perlidas* conjungens.

Sectio 1. *Palpi maxillares* 5-articulati. *Antennæ* thorace breviores, articulis subtùs 20.

Subgenus 1. EMBIA. *Latr.* TAB. nost., fig. 1—1*h*.

Antennæ 15-articulatæ; *alæ* nervo 3tio interno cum 4to nervis transversis connexo, hoc trifido.

Species 1. *Embia Savignii.* Westw.

Savigny, Description de l'Egypte; Neuroptera, *pl.* 2. *f.* 9.

Long. corp. lin $4\frac{1}{2}$. Expans. alar. lin. $8\frac{1}{4}$.

Habitat in Ægypto.

Nota. Descriptio specifica hujus insecti, quoàd colores, deest. *Alæ* obscuræ, lineis hyalinis inter nervos longitudinales.

Dixi in honorem Savignii—"*patientiæ*" exemplar—illustrissimus, infelicissimus.

Fig. 1
1.a
1.h
1.b
1.d
1.e
1.f
1.g
Fig. 2
2.d
2.f
Fig. 3
3.b
3.f

Subgenus 2. OLIGOTOMA*. *Westw.* TAB. nost., fig. 2—2*f.*

Antennæ 11-articulatæ, articulo ultimo apice submammillato; *alæ* nervo 3tio interno cum 4to nervis transversis haud connexo, hoc bifido.

Species 2. *O. Saundersii.* Westw.

Lutescenti-fuscescens, incisuris abdominalibus dilutioribus, alis pallidè fuscescentibus, vittis 5 angustissimis albis longitudinalibus inter nervos longitudinales positis.

Long. corp. lin. $3\frac{1}{4}$. Expans. alar. $5\frac{1}{4}$.

Habitat in Bengaliâ. Exemplum unicum à Dom. Gul. W. Saunders, Soc. Linn. Sodal., &c. captum, et mihi liberalitèr communicatum.

Sectio 2. (Subgenus 3.) OLYNTHA. *G. R. Gray.* TAB. nost., fig. 3—3*g.*

Palpi maxillares 4-articulati. *Antennæ* corporis ferè longitudine, articulis 32. *Alæ* nervo 4to interno trifido.

Species 3. *Olyntha brasiliensis.* G. R. Gray.

Piceo-niger, prothorace suprà femoribusque 4 anticis ochreis, antennarum articulis 10 ultimis albis, alis piceis, vittis albis inter nervos longitudinales, nervisque transversis tenuitèr albo marginatis.

Embius? Olyntha brasiliensis. *G. R. Gray in Griff. Anim. Kingd. no.* 32. *p.* 347. *pl.* 72. *f.* 2.

Long. corp. lin. $7\frac{1}{4}$. Expans. alar. lin. $11\frac{1}{2}$.

Habitat in Brasiliâ.

In mus. Dom. Children.

EXPLANATION OF TAB. XI.

Fig. 1. Embia Savignii.
2. Oligotoma Saundersii.
3. Olyntha brasiliensis.

* *ὀλίγος, paucus,* et *τομή, sectio.*

POSTSCRIPT.

Since the above was written, I have observed two apparently distinct species of this genus imbedded in gum copal, or anime, in the fine collection of Mr. Strong of Brook Green. One of these, which from its size may probably be the *Embia Savignii*, seemed, from the imperfect view only which I could obtain of it, to possess 14 joints in the antennæ; the other was of a larger size, with slightly stained wings, and 24 joints in the antennæ. From information received from Mr. David Don, it is not improbable that these gum insects are inhabitants of the eastern coast of Africa.

Still more recently I have observed a very small individual in an apterous state, of a dark brown colour with a fulvous head, in a collection made by Robert Templeton, Esq., R.A. in the Island of Mauritius. It is probably the larva of another and distinct species.

XIX. *De* Marchantieis. *Auctore* Thoma Taylor, *M.D., S.L.S.*

Read January 20th, 1835.

PLANTARUM plurimarum sexus, si non invenit, felicissimè illustravit Linnæus. Etiam in classe suâ *Cryptogamiâ* organa fœminea sàt benè sæpè agnovit: organa verò masculina aut caligine immersa aut luce insertâ velata reliquit. Omnium harum stirpium *Marchantieæ* sexus diversos clarissimè monstrant. Harum partes vegetationi propriæ annum per totum observantur; partes verò fructificationi servientes semel tantùm in anno atque solummodò tempestate calidiore evolvuntur, brevè mansuræ. Adsunt *receptacula* ordinis diversi, tamen figurâ generali et situ sàt similia. Quædam suprà occlusa, infrà rimantia particulas nigrescentes demittunt, quas earum germinatio testata semina esse probat. Sunt ergo fœminea. Alia verò infrà clausa, suprà ex folliculis effundunt liquorem viscidum albescentem in atmospherâ statim soluturum. Liquorem huncce pollinem non esse, minimè deduci potest ex eo quòd ejus applicatio adhuc non visa est, quoniam ex quibusdam plantis phanerogamis dioicis stirps mas à fœmineâ tam loco distat ut earum fœcundationem concludere, haud observare, datur. Receptacula hæcce proculdubiò fructificationi inserviunt, quoniam receptaculis fœmineis tempore semper paulispèr præcedunt atque priusquàm maturantur semina officiis funguntur. Prætereà in quibusdam speciebus, scilicet, *Hygropylâ irriguâ* et *Marchantiâ androgynâ*, aliquandò ejusdem pedunculi summitas partìm receptaculo hujus ordinis partìm receptaculo fœmineo sedem dat. Simili fato plantæ quædam phanerogamæ monoicæ atque dioicæ aliquandò hermaphroditæ evadunt. Neque quæstio inanis; si enim adsint receptacula reverà masculina maximi debent esse valoris ad hujus tribûs characteres genericos efformandos. Hoc cardine suffulta, dispositio sequens characteres alios gravissimos et ut dicam parallelos pandet.

Marchantieæ numero adhuc paucæ tamen orbis terrarum plagam occupant

latam. Species Michelio, Dillenio, atque Linnæo notæ, in Europâ ab mari Baltico usque ad mare Mediterraneum crescunt; et vulgatissima in Lapponiâ, Americâ totâ, et montibus Nepalensibus invenitur. Quædam rarò fructum educunt, aliæ in paucis diebus hoc officio funguntur. Omnes semel exsiccatæ, tardiùs, aquâ immersæ formas indicunt plenas. Unde nisi florentes videntibus studium difficile.

Marchantieis characteres communes sunt:

Receptaculum fœmineum inter frondis lobos terminale; junius subrotundum, sessile, indusiatum; maturum pedunculo canaliculato suffultum; fructum infrà ferens; in *loculos* divisum; loculis *capsuliferis*; capsulis *semina* plurima minuta inter *fila* lineâ spirali notata posita includentibus, apice rumpentibus, immaturis calyptratis.

Receptaculum masculinum sessile aut pedunculatum, cellulas includens, suprà per puncta hiantia pollinem lactescentem ex antheris oblongis effundentes.

Plantæ horizontales, procumbentes, frondosæ, oblongæ, lobatæ, infrà fibrillis plurimis simplicibus solo aut plantis subjacentibus affixæ: biennes, anno secundo fructum maturantes quamvis anno præeunte florum rudimenta apparent. *Frondes* effœtæ aut infecundæ apice propagines propellunt; steriles aliquandò in annum tertium vitam producunt.

Genera et species quas mihi fortuna obtulit.

MARCHANTIA. *Marchant. fil. in Act. Gallic.* 1713, *tab.* 5. *Linn.*

Receptaculum masculinum pedunculatum, subtùs squamosum. *Receptaculi fœminei* loculi 1—3-flori, bivalves, *calyciferi*; calyptrâ demùm ruptâ, in calyce relictâ.

Species.

1. *M. polymorpha*, receptaculo fœmineo radiatìm inciso, segmentis linearibus, loculorum marginibus ciliatis.

Marchantia polymorpha. *Linn. Sp. Pl. p.* 1603. *DeCand. Fl. Fran. tom.* ii. *p.* 421. *n.* 1133. *Mich. Gen. tab.* 1. *figg.* 1, 2, 5. *Hall. Hist. no.* 1891, *et* 1892. *Dill. Musc. tab.* 76. *et tab.* 77. *fig.* 7. *Schmid. Ic. tab.* 9. *et tab.* 29. *Hedw. Theor. ed.* 2. *tabb.* 26, 27. *figg.* 1, 2. *Sm. Engl. Bot.*

tab. 110. *Hook. et Tayl. Musc. Brit. ed.* 2. *p.* 219. *Spreng. Syst. vol.* iv. 234. *Lindenb. Syn. Hepat. p.* 100.

Habitat. Ferè ubique terrarum in locis tàm madidis quàm siccis. Floret in Hiberniâ æstate et autumno. (*v. v.*)

De specie sæpè atque benè dilineatâ et descriptâ perpauca dicenda. *Frondis* pororum ora incrassata. Superficiei infernæ adsunt squamæ (vel stipulæ) latè ovatæ, aut lunulatæ, scariosæ, albidæ, pinnatìm utrinque ad frondis axim longitudinalem dispositæ; his alternantur exterius squamæ longè aliæ, oblongæ, obtusæ, frondis marginem paulispèr excedentes. Adest et genus tertium squamarum, scilicet, purpurascentium secundum frondis lineam mediam situm. Hujus squamæ sunt oblongæ, alternæ, amplexantes, margine solummodò colore carentes, ita sibi invicem involutæ ut longam elevationem linearem, nervum simulantem efformant. *Capsula* minimè uti vult Lindenbergius fulva; *seminum* verò maturantium color flavus per capsulæ parietes pellucidos emicat. *Semina* tandem olivacea. Neque *capsula* dentata, sed apice demùm abnormitèr rupta, lacera. *Scyphi* (nunquàm cum Sprengelio receptacula dicendi) margine dentati; dentibus ciliâ solitariâ fuscâ, initio introflexâ, tandem erectâ, postremò caducâ præditis. Ad scyphi fundum et intra substantiam gelatinosam nidulantur gemmæ compressæ, subrotundæ, sublobatæ, in plantas completas abituræ. *Receptaculum masculinum* suprà scabrum, margine nunc ferè integro tum sæpiùs lobato, rariùs altiùs inciso, ut in *Marchantiâ chenopodâ* solet: subtùs adsunt radii tumidi, squamati, inter squamas fibrillosi. *Fibrilli* verò ejusdem sunt indolis ac ii subtùs frondes. *Squamæ* autem latissimè ovatæ, basi purpurascentes, apicem versus incolores, obtusissimæ, reticulatæ. Ad pedunculi summitatem adhærent processus 10—12, cellulosi, lineares, indusii reliquiæ. *Vesiculi antheriferi* obovati, suprà purpurascentes, collo coarctato. *Anthera* ovata, acuta, polline maturo lac crassum albidum viscidum simulante. *Receptaculi* utriusque ordinis pedunculi bicanaliculati; canali quovis fibrillos parallelos appressos, fibrillis radiciformibus omninò similes includente. Ante pedunculi elevationem horum fibrillorum fasciculi in tubo frondis axi longitudinali parallelo et frondem intra sito locantur; assurgente pedunculo per tubum trahuntur. Sic tubus facilè aquâ impletur, fibrillorum extremitates humectantur; cujus fabricæ

miracidæ ope crescit post ejus elevationem receptaculum. Organismus hicce cæteris *Marchantieis* solemnis.

In fronde, juventutis poros apertos nondum exhibentis, inter lobos locantur 4—6 squamæ latissimæ, purpurascentes, ex superficie frondis infernâ reflexæ, imbricatæ, adpressæ. *Indusii* vice fungentes, quas subtùs, ætate provectiore, oriuntur receptacula. Insurrecto verò pedunculo latis indusii vix vestigium superest.

2. *M. paleacea*, receptaculo fœmineo radiatìm inciso, segmentis obovatis; loculorum marginibus integris.

Marchantia paleacea. *Bertol. Spreng. Syst. vol.* iv. 234.

Habitat. In montibus Nepalensibus, unde Cl. Wallichius misit. In Etruriâ atque Liguriâ. *Bertoloni.* (*v. s.*)

Frons biuncialis, variè lobata, sinuata, oblonga, marginibus crenato-undulatis, porosa, poris apice marginatis. Subtùs adsunt *squamæ* acinaciformes utrinque ad lineam longitudinalem centralem pinnatìm dispositæ. *Radices* seu *fibrilli* simplices, albidæ, capillares. In paginâ frondis supernâ adsunt scyphi cyathiformes, margine serrati, depressi, proculdubiò gemmas laturi quamvis in meis exemplaribus forsitàn nimis vetustis, vacui. *Indusium* initio ovatum, sed pedunculo surgente discerptum; *squamis* exterioribus latioribus, ovatis, obtusissimis, integerrimis, intermediis acutioribus, dentatis, intimis, linearibus laciniatisque. *Squamæ* latiores basi, intermediæ medio, linearibus parti superiori apicique pedunculi adhærent.

Receptaculum fœmineum pedunculatum, conicum, basi ampliore, laciniatum, laciniis ex angustiore basi rotundatis. *Loculi* 4—6, bivalves, marginibus integerrimis, subuniflori, floribus calyculatis. *Calyx* rotundatus, ore angustissimo, ex quo in junioribus calyptræ stylus exsurgit. *Pedunculus* semiuncialis, firmus, obtusè angulatus, bicanaliculatus, utroque canali fibrillos fasciatos tenente. *Capsula* rubrotunda. *Semina* plurima rotundata. *Filamenta* lineas duas spirales includentia.

Receptaculum masculinum pedunculatum, suprà læve quamvis orificiis pollini exitum daturis punctatum, concaviusculum, margine scarioso, elevato, undulato; infrà subhemisphæricum, costatum, paleaceum, inter paleas fibrillosum.

In plurimus hujusce tribûs speciebus adhæsio indusii squamarum pedunculo valdè est notabilis. Partes enim officio functæ partibus posteà natis insident. Si verò squama indusii initio concentricè imponi concedatur, liquebit pedunculi partes altiores cum circulis intimis, inferiores cum exterioribus assurgere.

3. *M. chenopoda,* receptaculo fœmineo radiatìm brevitèr inciso, segmentis concavis truncatis; loculorum marginibus ciliatis; receptaculo masculino in quatuor lacinias lineares diviso.

Marchantia chenopoda. *Linn. Sp. Pl. p.* 1603. *Spreng. Syst. Veg.* ii. *p.* 234.

Lichen anapodocarpos. *Plum. Fil. p.* 143. *tab.* 142.? (icon pessima). *Dill. Musc. p.* 531. *tab.* 77. *fig.* 8.? (ex Plumierii tabulâ unde æquè mala.)

Habitat. In Jamaicâ Swartzio, in Guadelupâ, Martinicâ, et Insulâ S[ti] Vincenti. Exemplaria à Richardio lecta humanissimè mihi misit Hookerus. (*v. s.*)

Frondes 1—2-unciales, lineares, dichotomæ, segmentis apice bilobis, margine integerrimo; porosæ, pororum orâ albidâ marginata. *Frondium* pagina prona omnino nuda, nisi ad axin longitudinalem, ubi cum fibrillis simplicibus albidis radiciformibus occurrunt utrinque positæ squamæ formâ singulares, scilicet, ex integerrimâ latè ovatâ basi medio strangulatæ, dein latissime ovatæ, ciliatæ; pars infra strangulationem rachi appressa est, pars autem superior, minimè in eodem plano angulum ferè rectum cum rachi facit. *Squamæ* frondis apicem versus aggregatæ et reflexæ fructûs junioris indusium anticè efformant. In frondis paginâ superiore tum anni hujus tum præteriti adsunt scyphi obconici, margine serrati, frondis elevationem quandam includentes unde ora duplicia esse simulant. Intra scyphos, frondis basin versus curvatur cavitas, corpora lutescentia lentiformia levissimè lobata, proculdubiò gemmas, tenens. *Indusii squamæ* exteriores lanceolatæ aut latiores; interiores lineares, quarum paucæ hic illic pedunculo, plurimæ verò ubi pedunculus receptaculo committitur, adhærent.

Receptaculum fœmineum pedunculatum, hemisphericum, in 8—10 lacinias cavas incrassatas truncatas divisum; suprà tot costis elevatis quot adsunt laciniæ notatum; infrà indusii reliquiis squamulosum. *Loculus* unus sub quâque receptaculi laciniâ, marginibus ciliatis vel serrulatis. Exem-

plaribus meis in fertilibus desunt calyptra, calyx et capsula. *Pedunculus* vix semiuncialis, (forsitàn in fœcundis multò longior esset) bicanaliculatus, squamis indusii linearibus obsitus. *Pedunculi canalis* uterque fibrillorum radiciformium fasciculum tenet.

Receptaculum masculinum pedunculatum in lacinias quatuor lineares altè divisum, laciniis vix ad crucem effigurandum oppositis; suprà antherarum loculis apice subrotundis unipunctatis per totam laciniæ axin emergentibus; subtùs squamis fibrillisque radiciformibus insertis. *Squamæ* hæ ex latâ basi acuminatæ, scariosæ. *Laciniarum receptaculi* margo nudus pellucidus.

Icon Plumieri aut pessima aut quod olim suspicatus est Dicksonus aliena. Intereà mente reponendum est plantam suprà definitam in Indiâ Occidentali sæpissimè plurimis, qualem verò delineavit adhuc nulli nisi Plumiero ipso obviam fuisse.

4. *M. androgyna*, receptaculo fœmineo subintegro, subhemisphærico, sub-4-angulato, loculorum marginibus integris undulatis.

Marchantia androgyna. *Linn. Sp. Pl. p.* 1605. *Sm. Engl. Bot. tab.* 2545. (exclusis figuris duabus inferioribus). *Sm. in Rees Cyclop. in loco. Dicks. Crypt. Fasc.* ii. *p.* 17. *With. Bot. Arr. vol.* iii. *p.* 861.

Marchantia quadrata. *Scop. Carn. tab.* 63. 1356.

Marchantia triandra. *Scop. Carn. tab.* 63. 1355. (fide *Mohrii autoptæ.*)

Marchantia hemisphærica. *Linn. Fl. Suec. n.* 1052. *et Fl. Lapp. n.* 424. *Schmid. Ic. tab.* 34. *Wahl Fl. Lapp. p.* 398. *Web. et Mohr. Crypt. Germ. p.* 388.

Marchantia commutata. *Lindenb. Syn. Hepat. p.* 101.

Habitat. Ad fluminum ripas saxosas umbrosas et ad montium latera uda per totam Europam. Viget à maris planitie ad usque 1500 ped. altit. Floret in Hiberniâ apud Dunkerron, in comitatu Kerriensi, vere, æstate atque autumno. (*v. v.*)

Frons 1—2-uncialis, oblonga, sinuata, apice ut in cæteris biloba, marginibus crenatis, depressis, plerumque purpurascentibus, porosa. *Receptaculum fœmineum* pedunculatum, margine subintegro seu lacero, subquadratum, suprà obtusè 4-costatum. *Loculi* ferè semper quatuor, quorum sæpiùs

unus et alter sterilis et ideò collapsus; *fœcundorum* verò marginibus initio plicatis demùm expansis, semper undulatis. *Calyces* plerumque duo vel tres in quovis loculo, reticulati, albidi, rotundi, apice dentati, inclusi.

Squamæ seu *stipulæ* frondes juniores subtùs observandæ, purpureo-nigrescentes, oblongæ, acinaciformes, circa propagines intricatæ.

Indusium rotundatum depressum, squamis multifidis, laciniis linearibus articulatis, purpurascentibus, quarum e medio exsurgit pedunculus 1—2 uncialis, infrà ruber, suprà pallide virens, bicanaliculatus, canali utroque fibrillorum radiciformium fasciculum tenente. Sæpenumero exemplaria vidi pedunculi fœmineique et masculini connascentis, unde stirpi facies androgyna. *Calyptra* rotundata, styligera. *Capsula* globosa brevissime pedicellata. *Semina* submuricata rotundato-tetrahedra, fusca. *Fila* lineas duas spirales includentia.

Receptaculum masculinum pedunculatum, peltatum, margine demùm elevato, scarioso, irregulari, tamen indiviso.

Antherarum loculi pedunculi ab apice radiatìm dispositi. *Antheræ* oblongæ. *Pedunculus* crassissimus, obtusè angulatus, sicut fœmineus, bicanaliculatus, sed fœmineo humilior; quamvis notandum est exeunte autumno in locis apricioribus receptacula fœminea observavi ferè sessilia. Aliquandò pedunculi duo masculini connascuntur receptacula duo masculina ferentes. *Receptaculi masculini* juniores et adhuc sessilis margo scariosus subtùs inflectitur, senioris verò atque pedunculati reflexus tollitur.

Si nominum trivialium prioritas servanda est nomen Linnæi antiquius retinendum. Certò certiùs quamvis artis magister differentiarum inter hanc stirpem suamque *Marchantiam hemisphœricam* vix recordatus est, nomen in *Florâ Suecicâ* et *Florâ Lapponicâ* commutans, tamen primus nostram *Marchantiam androgynam* nuncupavit. Scopolius fatetur suam *M. quadratam* minimè hac differre nisi receptaculo subquadrato a Linnæo haud notato. Prætervisu tamen nota latis facilis est, quoniam vix aut egre, nec semper observanda. Nostram sub nomine *M. hemisphœricæ* optimè descripserunt Schmidelius et Wahlenbergius, ignotam æquè Michelio, Dillenio, atque Hallero.

FEGATELLA. *Cæsalp. Raddi.*

Receptaculum masculinum in frondis foveolâ sessile.

Receptaculum fœmineum loculos tegens ; *loculi* 4—9, rima verticali aperientes ; *calyces* nulli ; *calyptrâ* demùm ruptâ in loculo relictâ.

Nomen ex *Cæsalpino*, quamvis dubitandum anne ita *Marchantiam polymorpham* L. aut *M. conicam* L. insignivit. In hoc genere *Loculus* ex membranâ receptaculi interiore conflatur. Intra hancce membranam receptaculique exteriorem materies plurima cellulosa subviridis interponitur. Structura hæcce in junioribus facilè observanda nulli alio *Marchantiearum* generi communis.

1. *F. conica,* receptaculo fœmineo conico apice coarctato obtuso, capsulis demùm exsertis.

Marchantia conica. *Linn. Sp. Pl. p.* 1604. *Sm. Engl. Bot. tab.* 504. *DeCand. Fl. Fran. tom.* ii. *p.* 423. *No.* 1136. *Hook. & Tayl. Musc. Brit. ed.* 2. *p.* 221. *Mich. Gen. tab.* 2. *fig.* 1. *Dill. Musc. tab.* 75. *fig.* 1. *Schmid. Ic. tab.* 31. *Hedw. Theor. ed.* 2. *tab.* 28.

Fegatella officinalis. *Raddi in Opusc. Scient. di Bologna,* ii. *p.* 356.

Habitat in umbrosis, udis, per totam Europam. In Americâ Boreali. *Sprengel.* Floret primo vere apud Dunkerron in comitatu Kerriensi, Hiberniæ. (*v.v.*)

De plantâ vulgari et sæpiùs descriptâ perpauca tantùm addenda. *Frondes* latæ, lineares, dichotomæ ; *steriles* longiores aliquandò semipedales ; marginibus crenatis, undulatis ; *fertiles* colore saturatiori. *Pori* cellularum in centris hexagonarum. *Propagines* primo vere angustæ, marginibus involutis, inter præteriti anni lobos exeuntes, adscendentes, recurvatæ, demum in frondes læte-virentes explicatæ. *Squamæ* seu *stipulæ* subrotundæ, obliquæ, subemarginatæ, in senioribus obsoletæ. *Scyphi* soboliferi nulli. *Fructificatio* dioica. *Receptaculum masculinum* infrà hemisphæricum, læve ; suprà planiusculum ; sessile, tamen frondis foveolæ ejus centro commissum, ope disci, cujus diametrum pedunculi receptaculi fœminei latitudini æquat : ideò, quamvis frondi quasi immersum, tamen totâ basi minimè adhærens. Adsunt sub apices conicos vesiculi antheriferi, albidi, antheris lineari-oblongis æstate maturantibus. *Receptaculi fœminei* pedunculus ex foveolâ terminali anticè apertâ oritur.

Vidi receptacula fœminea in Octobri macta, tamen eorum pedunculi non nisi in Februario sequente surrexerunt; alia quorum semina animalculo quodam depasta erant nunquàm extollebantur. *Loculi* 4—9, uniflori, rariùs biflori, capsulâ maturâ egressurâ demùm apice verticalitèr rupti.

Calyx proprius nullus, calyptræ verò pars post capsulæ exitum relictæ calycem simulat. *Calyptra* oblonga, apice demùm laciniatìm diffracta, styligera, intra loculum manens. *Capsula* oblonga, apice in lacinias demùm revolutas prorumpens. *Semina* subrotunda, viridia, tandem glabra, fusca, cum filis duas lineas spiralis claudentibus mista. *Pedunculi* subangulati, infrà crassiores dilutè purpurei, suprà pellucidi vix virescentes, unicanaliculati, ex canalis marginibus involutis teretes, diebus paucis exoleti. In pedunculi canali fibrillorum fasciculus tenetur. Ubi receptaculo pedunculus committitur circumpositi sunt fibrilli forsitàn ex canali jam dicto evasi. *Fructûs* junioris indusium depressum, ex squamis 4—5, inter frondis lobos terminales, marginem supra replicatis, circularibus aut lunulatis, peripheriam versus purpurascentibus confectum. *Pedunculo* elongato indusium haud ampliùs observandum.

2. *F. hemisphœrica,* receptaculo fœmineo hemisphærico, margine in lobos 4—6 inciso; capsulis sessilibus.

Marchantia hemisphærica. *Linn. Sp. Pl. p.* 1604. *Hall. Hist. no.* 1890. *DeCand. Flor. Franc. tom.* ii. *p.* 422. *Spreng. Syst. vol.* iv. *p.* 334. *Mich. Gen. tab.* 2. *f.* 2. *Dill. Musc. tab.* 75. *fig.* 2.

Rebouillia hemisphærica. *Raddi in Opusc. Scient. di Bologna,* ii. *p.* 357.

Grimmaldia hemisphærica. *Lindenb. Syn. Hepat. p.* 106.

Habitat. Solo calcareo ad margines declivitatum præruptas minimè verò udas per totam Europam. In Novâ Hollandiâ. *Sprengel.* Floret mensibus Martio et Aprili apud Dunkerron in comitatu Kerriensi, Hiberniæ. (*v. v.*)

Frondes unciales aut biunciales, dichotomæ aut variè lobatæ, sinuatæque, teneræ, anticè latiores, marginibus crenulatis, elevatis, brunneo-purpurascentibus, scariosis; porosæ, poris e cuticulâ levitèr sublatâ conflatis. Subtùs adsunt fibrilli simplices, frondis lineæ axili adnexi. Adsunt et squamæ purpurascentes, imbricatæ, planiusculæ, utrinque pinnatìm positæ, spatii vero dimidium inter frondis axin et peripheriam vix percurrentes, ex lata

basi rotundatæ, bicornes, seu ciliis duabus majoribus incurvis præditæ. *Scyphi* soboliferi omninò desunt, quamvis tales delineavit Michelius. Quoniam verò cum nostrâ sæpiùs intertexta crescit *Lunularia vulgaris*, hujus scyphi facillimè fallere possunt; totis forsitan error Michelianus. Manum Michelii nimis ornantem olim reprehendit Dillenius. Tabulæ Dillenianæ absunt scyphi.

Plantam utplurimum dioicam rariùs monoicam observavi. *Receptaculum fœmineum* initio subrotundum, posteà hemisphæricum, demùm rursus, capsulis deorsùm tumentibus, subrotundum; in lobos aut lacinias 4—6 divisum. *Loculi* tot quot receptaculi laciniæ, rariùs 7, 8, aut 9; *aperturis* verticalibus, bivalvibus, margine involutis, ex membranâ receptaculi superiore continuatâ efformatis. *Calyces* proprii nulli: unde genus, *Grimmaldia*, à Raddi conditum, Lindenbergio placitum vix observationibus certis suffultum est. *Capsulæ* utplurimùm solitariæ; rariùs binæ appressa; nunquam eminentes, sed in loculi fundo sessiles. *Calyptra* styligera, demum ruptâ, relictâ. *Semina juniora* seu globuli annulati, annulo pellucido, videntur; diebus 10 aut 15 actis globuli lineis pellucidis in tres sectores dividuntur; vi compressi in punctâ minutâ fuscâ resolvuntur, quæ forsitan *semina vera* ponenda. *Structuram* hancce in omnibus *Marchantieis* atque in *Jungermanniis* frondosis quas recentes scrutari licebat, observavi. Globuli supradicti initio flavi posteà fusco-olivacei, triquetro-subrotundi. *Fila* lineas duas spiralitèr tortas claudentia. *Indusii squamæ* exteriores latiores, et ferè ad basin usque fissæ, interiores lineares longiores, omnes albidæ, reticulatæ, receptaculum fœmineum junius involventes tegentesque, posteà pedunculi commissuræ cum receptaculo adhærentes, pendentes; unde receptaculi sublevati basis pilosa evadit. *Squamarum* paucæ hic illic pedunculo affiguntur. *Receptaculum masculinum* fusco-purpureum, subrotundum, marginatum, suprà subplanum, sessile, frondi immersum tamen nec nisi disco centrali minimo affixum, unde quasi in frondis cavitate receptum: adsunt suprà globuli fusco-purpurei unipunctati, quorum ex apicibus pollen liquidum lactescens effluit.

FIMBRARIA. *Nees.*

Receptaculum masculinum submarginatum, antheræ frondis tumori immersæ.

Receptaculum fœmineum subhemisphæricum, pedunculatum. *Calyx* proprius nullus. *Loculi* 3—4, uniflori rariùs biflori. *Calyptra* loculo longior, persistens, in lacinias subæquales fissa, capsulam maturam tegens.

F. fragrans, receptaculo fœmineo obtusè conico apice integro subrotundo, subtùs in lobos 3 aut 4 diviso, indusio subrotundo pedunculi circa basin persistente. (*v. s.*).

Fimbraria fragrans. *Nees ab Esenb. in Hor. Phys. Berol. p.* 45. *Spreng. Syst.* iv. *p.* 235. *Lindenb. Syn. Hepat. p.* 108.

Marchantia fragrans. *DeCand. Flor. Franc.* ii. *p.* 423.

Habitat. In Helvetiâ, Galliâ, atque Italiâ. Exemplaria Prof. Hookeri amicitiæ debeo.

Frons vix semiuncialis, ex angustâ basi lineari-oblonga, concava, in lobos duos apice divisa, margine crenulato, involuto, minutissimè porosa, suprà lutescens, infrà purpurascens, subtùs per lineam longitudinalem axalem fibrillos simplices demittens. *Squamæ* seu *stipulæ* ex latâ cordatâ basi longiùs acuminatæ, acuminibus anticè vergentibus, basibus verò purpurascentibus scariosis, reticulatis. *Indusium* insigne, albidum, ex squamis plurimis erectiusculis pedunculi basin tegentibus conflatum; *squamis* exterioribus ovato-lanceolatis apice incisis, mediis lanceolatis laciniatis, intimis linearibus, reticulato-articulatis. *Pedunculus* semiuncialis, plerumque minor, brunneus, opacus, glaber, cui squamæ indusii nullæ adhærent; unicanaliculatus fibrillos simplices parallelos iis radiciformibus similes includens. *Receptaculum masculinum* sessile aut potiùs ex frondis tumore oblongo nec circumscripto formatum; cui pori, scilicet antherarum loculorum apices, subrotundi nigrescentes insident. *Receptaculum fœmineum* conicum, apice obtusum, rotundatum, subtùs in lobos 3 aut 4, tot loculos tegentes diviso. *Loculi* cylindrici, marginibus distinctis. *Calyx* proprius nullus. *Calyptra* albida, reticulata, reticulis oblongis, speciosa, exserta, cujus pars loculo inclusa cylindracea, pars verò eminens multò latior subsphærica acuminata longitudinalitèr fissa, apice autem sæpissimè integra. *Capsula semina* futura apice eroso-disrupta, minimè in lacinias

normales divisa, reticulata, reticulis subrotundis. *Semina* triquetri-globosa, plurima, scabriuscula. *Fila* lineâ spirali intùs notata, seminibus triplò longiora, utrinque acuminata. *Scyphi* soboliferi nulli. *Propago* ex fronde senili prope pedunculi basin exit.

1. *F. tenella,* receptaculo fœmineo subhemisphærico apice integro subrotundo subtùs in lobos 3 aut 4 diviso, indusio pedunculi circa basin subnullo.

Marchantia tenella. *Linn. Sp. Pl. p.* 1604. *Sm. in Rees Cyclop. in loco. Dill. Musc. tab.* 75. *fig.* 4.

Habitat. " In Americæ statibus fœderatis, calidioribus, *Belvisius,*" cujus exemplaria sortila mihi protulit benignissimè Prof. Hookerus. (*v. s.*)

Frons tri- vel quadri-linearis, apice lenissimè in lobos duos divisa, oblonga, margine subintegro, minutè porosa, poris ut in congeneribus ex cuticulâ albidâ lenitèr sublatâ conflatis; suprà saltem in exemplaribus exsiccatis lutescens. *Squamæ* seu *stipulæ* ex latâ basi acuminatæ. *Receptaculum masculinum* est post receptaculi fœminei pedunculum frondis tumor, quem suprà pori fusci, scilicet antherarum loculorum apices coronant. *Receptaculum fœmineum* subhemisphæricum, apice rotundato, subtùs in lobos tres aut quatuor divisum. *Loculi* obovati. *Calyx* proprius nullus. *Calyptra* albida reticulata in lacinias lateralitèr fissa, laciniarum verò apices utplurimùm disjuncti. *Capsula* subglobosa, apice demùm eroso-disrupta. *Semina* subrotunda, scabriuscula, filis spiralibus triplò breviora. *Indusii* squamæ paucæ, exteriores ovatæ, longiùs acuminatæ, interiores angustiores; vix una atque altera post pedunculi elongationem ejus basi affixa manet. *Pedunculus* uncialis et ultrà, gracillimus, brunneus, opacus, glaber, unicanaliculatus fibrillos parallelè fasciatos iis radiciformibus similes includens. *Receptaculis fœmineis* lobatis, majoribus, frondis basi angustiore, et patria calidiore à *Marchantiá pilosá* Wahl. (*F. tenellá* Nees.) diversa.

2. *F. pilosa,* receptaculo fœmineo hemisphærico subintegerrimo areolis tumentibus scabriusculo, pedunculo suprà nudo glaberrimo.

Marchantia pilosa. *Wahl. Fl. Suec. ed.* i. *p.* 792.; *Fl. Lapp. p.* 399.; *Fl. Upsal. p.* 399. (nec *Fl. Dan. tab.* 1426.)

Marchantia tenella. *Wahl. Fl. Suec. ed.* 2.

Marchantia gracilis. *Web. et Mohr. Crypt. Germ. p.* 389. *Web. Prodr.* 103.
Fimbraria tenella. *Nees ab Esenb. in Hor. Phys. Berol.* (fide *Lindenbergii*). *Lindenb. Syn. Hepat. Europ. p.* 109.

Habitat. In Sueciâ et in alpibus Helveticis. Misit benignè clar. C. G. Myrin exemplaria minora ad Godtsundam (ubi specimina sua legerat Weberus) majora ad Henricksholm Daliæ lecta. Exemplaria Helvetica Schleicheriana dedit amicissimus Prof. Hookerus. (*v. s.*)

Frons 1—3-linearis, oblonga, apice biloba, marginibus scariosis crenatis purpurascentibus, porosa, poris minutis. *Squamæ* seu *stipulæ* latè lunulatæ 1—2-cornes, terminantes verò ex basi rotundatâ subulatæ, omnes purpurascentes, tenerrimè reticulatæ. *Indusii squamæ* circa pedunculi basin manentes, exteriores ovatæ, mediæ ovato-subulatæ, intimæ lineares, omnes reticulatæ. *Receptaculum fœmineum* hemisphæricum, subintegrum, margine crenato, superficies convexa ex cellulis tumidis quasi scabra. *Loculi* utplurimùm tres. *Calyces* proprii nulli. *Calyptra* receptaculi diametro æqualis, 9—12-laciniata, laciniis lineari-lanceolatis, albidis, pellucidis, apice demùm sejunctis, quamvis ætate etiam provectâ segmenta calyptræ aliquandò apice connasci vidi. *Capsula* subrotunda, junior apice planiuscula, matura circa medium horizontalitèr disrumpens. *Semina* plurima, scabriuscula, subrotunda, fusca, juniora autem læte-viridia, lævia, angulata, subtrigona. *Fila* spiralia cum helice duplici. *Pedunculus* longitudine varians, jam lineam tantùm, tum unciam longus, unicanaliculatus, in canali adsunt fibrilli simplices iis radiciformibus omninò similes. *Receptaculum masculinum* est frondis elevatio tumens post receptaculi fœminei pedunculum sita, cui 6—7 corpora punctata, nigrescentia eminent, scilicet, antherarum loculorum apices.

3. *F. nepalensis,* receptaculo fœmineo hemisphærico subintegerrimo subtrilobato areolis tumentibus scaberrimo, pedunculo suprà squamis indusii manentibus piloso.

Habitat. In Nepaliâ; undè exemplaria solo calcareo affixa misit cl. Wallichius. Specimina etiam sub nomine ex Herbario Hookeriano nupèr recepi. (*v. s.*)

Frons vix semiuncialis, apice biloba, porosa, poris ex cuticulâ lenitèr sublatâ

conflatis. *Squamæ* seu *stipulæ* ovato-triangulares, longiùs acuminatæ, acumine curvato, pinnatìm positæ. Subtùs ex lineâ axili demittuntur fibrilli simplices, albidi, punctati. *Receptaculum masculinum* est frondis tumor oblongus, anticè marginatum, margine elevato, ad frondis angustioris basin positus, unde planta (saltem aliquandò) dioica. Ora loculorum antheriferorum plurima, nigricantia, pertusa supra tumorem tolluntur. *Receptaculum fœmineum* suprà ex cuticulæ bullis scaberrima, margine juniorum subintegro; *fructu* verò tumente receptaculum in lobos quasi divisum, minimè verò incisum est. *Loculi* 3—4, margine in lacinias obtusas crassas divisi. *Calyx* proprius nullus. *Calyptra* flavescens, ovato-acuminata, apice styligera, parte loculo inclusâ integrâ, exsertâ verò in lacinias lanceolatas apice connatas divisa. *Capsula* globosa, nec calyptram totam implens, pariete calyptræ laciniis opaciore, cellulis verò minoribus rotundioribus. *Semina* obtusè triquetra, plurima, scabriuscula, majora, brunneo-rubra. *Fila* spiralia cum helice simplici, seminibus bis longiora. *Pedunculus* unicanaliculatus, fibrillos fasciatos iis radiciformibus similes tenens, cujus basi duo aut tres lanceolatæ, hìc illìc paucæ, apici verò plurimæ indusii squamæ articulatæ adhærent. Propago fœminea ex fronde senili prope pedunculi basin exit, biloba; propago verò masculina est frondis senilis productio angustior, elongata, concava.

Lunularia. *Mich.*

Receptaculum masculinum sessile, margine membranaceo elevato. *Receptaculum fœmineum* in loculos teretes altè divisum. *Loculi* apice rimâ horizontali aperientes. *Calyces* nulli. *Capsula* quadrivalvis, exserta.

Genus olim Michelio placuit: firmum esse suadent scyphi soboliferi lunulati, receptaculi masculini forma, et receptaculi fœminei habitus quasi *Jungermanniæ* speciem umbellatam simulans.

1. Lunularia vulgaris. *Mich. Gen. tab.* 4. *Raddi in Opusc. Scient. di Bologna,* ii. *p.* 355.

Marchantia cruciata. *Linn. Sp. Pl. p.* 1604. *Hall. Hist. no.* 1888. *Huds. Fl. Angl. p.* 52. *no.* 2. *With. Arr. vol.* iii. *p.* 869. *DeCand. Fl. Franç. tom.* ii. *p.* 424. *no.* 1138. *Dill. Musc. tab.* 75. *fig.* 5.

Marchantia? lævis. *Hook. Brit. Fl. vol.* ii. *p.* 103.

Habitat. In umbrosis, minimè verò udis, præsertìm solo calcareo ferè ubiquè Hiberniæ et in Europâ australi. Floret æstate apud Dunkerron in comitatu Kerriensi, Hiberniæ.

Frons densè gregaria, uncialis, in locis verò tepidis hortorum aliquandò 2—3-unciales, læte-virens, lucens, oblonga, anticè latior, lobata lobis tribus aut quatuor, lateralibus fructum ferentibus, margine lenitèr undulato et elevato, porosa; subtùs adsunt squamæ seu stipulæ albidæ, scariosæ, acinaciformes, ex axi longitudinali orientes, ad margines usque ferè tendentes, in frondibus junioribus obviæ in antiquis obsoletæ. Adsunt quoquè frondem subtus fibrilli plurimi, radiciformes, simplices, pellucidi, eorum extremitates versus tortuosi, soli vel plantarum paginæ subjacentium tenaces. *Receptaculum fœmineum* pedunculatum, junius indusiatum, ferè globosum, assurgente autem pedunculo oblongius, demùm ex ejus disco centrali minimo elonguntur processus tubulosi, numero varii, quamvis utplurimùm quatuor, loculos efformantes, apice rimâ *horizontali* aperientes. Minimè uti Dillenius delineavit et ejus sequaces voluerunt receptaculum contra *Marchantiearum* legem universam ex frondis paginâ superiore nascitur. Sinûs frondium lateralis in imo recessu foveola adest ferè circularis, frondis marginem versus aperta, cui adversâ ex parte frons partìm imminet et ità fructûs indusium junius quodammodò tegit. *Indusii* latè ovati squamæ exteriores sunt sex aut plures concavissimæ, obtusissimæ, integerrimæ, albidæ, reticulatæ; intermediæ apice laciniatæ; intimæ verò lineares, articulatæ, quarum plurimæ pedunculi elati basin induunt, aliæ pedunculi imæ parti hìc illìc adhærent. *Pedunculus* succulentus, candidus, pellucidus. *Loculi* rariùs solitarii aut numero sex, sæpè duo, tres aut quinque, sæpissimè verò quatuor, tubiformes, albidi, pellucidi, uniflori, rariùs biflori. Patet characterem generis ex receptaculi divisione sumptum esse omninò lubricum. *Calyx* proprius nullus. *Calyptra* sphærica, styligera, demùm rupta, in loculi fundo relicta. *Capsula* ovalis, nigricans, longiùs (quàm in cæteris *Marchantieis*) pedicellata, pedicello uti in *Jungermanniis* pellucido; quadrivalvis, valvis sæpè bifidis. *Semina* plurima fusca minuta, subrotunda cum filis lineâ spirali notatis mista. *Receptaculum masculinum* sessile, tamen frondi tantùm immersum nec nisi puncto imo commissum; *frondis* ex sinûs imo recessu assur-

gens, oblongum, subundulatum, suprà concavum, margine scarioso, elevato, anticè apertum et introitum squamis 4—6 replicatis sinens. *Receptaculo* insident pori plurimi, juniores virides, effœti nigricantes, apicibus pertusis apertis ex quibus liquor viscidus lactescens effunditur. Liquor verò ex antheris ovatis immersis secernitur. *Frondes antheriferæ* per autumnum atque hyemem, capsuliferæ per æstatem, scyphiferæ verò per omnem anni tempestatem vigent. *Scyphi* soboliferi stirpibus tum masculinis tum (contra Dillenium) aliquandò fœmineis, semper verò infertilibus adsunt, lunulati, undè generis nomen. *Scyphorum* ad imam partem in substantiâ cellulosâ immersa atque sese contingentia plurima observanda corpora lentiformia, materiei cellulosæ ope vasi filiformis ex sinu eorum minutulo progredientis commissa; *propaginum* vice fungentia, situs axillaris atque excussorum vegetatio testata arguunt. *Receptaculi fœminei pedunculi* tenelli atque succulenti post dies tres aut quatuor marcescunt; unde florescentiæ transitus brevis et observatio rara. Infelicitèr indusium indole et officio alienum calyx nominaverunt autores. Contra Michelii tabulam stirps semper dioica.

Hygropyla.

Receptaculum masculinum pedunculatum, pilis brevibus hirsutum. *Receptaculum fœmineum* pedunculatum, pilis brevibus hirsutum. *Calyx* proprius nullus. *Loculi* univalves, carnosi, apice rimâ verticali aperientes. *Frondes* eporosi.

1. *H. irrigua,* receptaculo fœmineo suprà planiusculo subtùs squamoso.
Marchantia irrigua. *Wilson in Hook. Brit. Fl. vol.* ii. *p.* 106.
Habitat. In recessibus irriguis saxosis umbrosis. Apud pontem Blackwater dictum in baroniâ Dunkerron sterilem inveni anno 1820. Apud "Turk Cascade" fructiferum primùm detexit Gulielmus Wilson 1829, ubi eodem anno fructum observavi. Apud "Maghanabo Glen" atque apud "Ballinhassig Glen." *Gul. Wilson.* Hiberniam extra adhuc ignota. (*v. v.*)

Frons 1—5-uncialis, unciam circitèr lata, membranaceo-carnosa, procumbens, biloba, lobis margine elevatis, lenissimè undulatis, rotundatis, semipellucida, læte-virens, senectute fuscescens, uninervis, eporosa, sed pororum

loco ex nervo centrali longitudinali orientes rami utrinque divergunt, ramulosi et anastomosantes in superficiem tàm pronam quàm supinam. Structura hæcce anomala in exemplaribus exsiccatis difficillima visu. Uti frondis faciei supernæ pori, inferiori æquè squamæ seu stipulæ (in cæteris ejusdem ordinis generibus solennes) desunt. Infrà ex toto nervo demittuntur fibrilli longiusculi, fasciati, simplices, albidi, soli aut plantarum subjacentium tenaces. *Scyphi* soboliferi nulli. *Fructificatio* utplurimùm dioica, haud rarò monoica, aliquandò etiam androgyna, quoniam pedunculus idem receptaculo partìm antherifero partìm capsulifero coronatur. In hoc casu notatu dignum est dum capsulæ vigent antheræ longè anteà officiis functæ semper effœtæ: undè forsitàn ponere licet quod in omnibus stirpibus phanerogamis datur, pollinis effusionem seminum maturitati antecedere. *Receptaculum masculinum* suprà planum, granulatum, circulare, centro depresso, infrà hemisphæricum, totum carnosum, viride, ætate fuscescens, ad marginem præsertìm setis brevibus rectis extrorsùm radiantibus albidis hispidum. Intra receptaculi substantiam carnosam positæ sunt cellulæ plurimæ, ovatæ, erectæ ora apud superficiem superiorem pandentes; vi compressæ globulos exiguos oleaginosos emittentes, antheras ovatas acutiusculas, incolores, pellucidas tenentes. Apud receptaculi basin pedunculi summitati affixæ manent squamæ paucæ, lineares, planæ, reticulatæ fuscescentes, indusii reliquiæ. *Pedunculus* longitudine receptaculi diametro vix æqualis, succulentus, infrà virescens, suprà fuscus, striatus, bicanaliculatus, quovis canali fibrillos fasciatos simplices radiciformes tenente. *Receptaculum fœmineum* initio indusii squamis linearibus recurvantibus omninò tectum, posteà auctum planosphæricum evadit atque sæpissimè infertile et sessile manet; fœcundatum verò pedunculo fertur. Superficies ejus superior fit valdè irregularis, hìc illìc depressa atque undulata, margine elevato; inferior autem in loculos numero varios, rotundatos, carnosos divisa et setis paucis brevibus rectis obsita est. *Loculi* fertiles rimâ parvâ terminali verticali aperientes. *Capsulæ* pedicellatæ globosæ exitum dant. *Capsula* statìm in lacinias inæquales quatuor aut sex disrumpitur. *Calyptra* ruptæ reliquiæ circa capsulæ pedicelli basin intra loculum manent. *Calyx* proprius nullus. *Semina* angulato-rotundata, fusca. *Fila* spiralia elongata tenuia vix flexa.

Pedunculus 1—2-uncialis, succulentus, incrassatus, semipellucidus, viridescens, flexuosus, bicanaliculatus canali quovis fibrillos fasciatos simplices iis frondem subtùs omninò similes tenente. Apud pedunculi commissuram receptaculo adhærent squamæ indusii paucæ. Mense Martis receptaculi fœminei prima rudimenta visa, posteà diu diligentissimè observata non nisi æstate alternâ maturabantur. *Stirps* suaveolens. Charta bibula cujus ope exsiccabantur exemplaria mea per biennium quotiès igni admota odorem tenuem gratissimum edidit; undè aroma oleo haud citò volatili tribuendum.

2. *H. nepalensis,* receptaculo fœmineo hemisphærico, subtùs nudo.
Habitat. In locis irriguis argillosis montium Nepaliæ, undè misit cl. Wallichius. (*v. s.*)

Frons 2—3-uncialis, dichotoma, lineari-oblonga, plana, procumbens, lobis duobus terminata, membranacea, tenuis, semipellucida, fusco-virens, marginibus undulatis, uninervis, nervo fibrillos simplices, radiciformes, albidos, frondem subtus dejiciente. Adsunt neque suprà pori nec subtùs squamæ seu stipulæ. Ex nervo axili crassiori utrinque tenuiores oriuntur approximati ferè paralleli antrorsùm paginam percurrentes nunquàm verò frondis marginem attingentes. *Scyphi* soboliferi nulli. *Receptaculum masculinum* non visum. *Receptaculum fœmineum* hemisphæricum, scabrum, setis strictis, brevibus, paucis obsitum, fuscum, in lobos 2—6 utplurimùm 4 divisum. *Lobus* quivis *loculum* oblongum, rotundatum, radiatum, carnosum tegit. Ex loculorum rimâ verticali terminali exit *capsula* fusca, globosa, pedicellata in lacinias tres aut quatuor disrumpens. *Calyptra* rotunda, styligera, demùm in loculi fundo relicta. *Semina* fusca rotundato-angulata. *Fila* spiralia, longa, tenuia, fuscescentia, helice simplici. *Calyx* proprius nullus. *Propagines* læte-virentes ex sinu inter frondis lobos oriuntur.

Ex suprà dictis inferri possunt propositiones sequentes:

1. In *Marchantiâ* calyces proprios adesse; scyphos soboliferos cyathiformes inveniri: atque frondium poros oribus marginatis instrui.
2. In *Fegatellâ* atque in *Lunulariâ,* generibus inter se diversissimis, receptacula masculina frondi immersa, tamen nec nisi disco parvo frondi commissa esse.
3. In *Fimbrariâ* semina intra calyptræ persistentis cavitatem effundi. Receptaculum masculinum nil nisi frondis tumorem.
4. In *Lunulariâ* capsulam normalitèr in lacinias quatuor dividi; loculos rimâ horizontali dehiscere; atque scyphos soboliferos lunulatos adesse.
5. In *Hygropylâ,* receptacula tum masculina quàm fœminea setis, madore rectis, strictis hirsuta esse; loculos calycum propriorum expertes; frondem eporosam, exstipulatam, nervos tenuissimos in utrâque superficie anastomosantes (in *Hepaticis* exemplum unicum!) exhibere.
6. Receptaculi fœminei superficies superior omninò ejusdem indolis ac frons, undè vegetationi propria. Crescere observatur receptaculum post ejus sublationem. Ad hoc receptaculum assurgens secum per pedunculi canalem sursùm trahit radices olim in tubo frondem subtus positas. Undè patet fibrillos fasciatos pedunculo inclusos reverà radices esse.
7. Indusium, tum pedunculi ad basin relinqui, tum sæpiùs discerpi, ejusque partes pedunculi apici hærentes faciem pilosam capsulæ basi præbere.
8. Receptaculum fœmineum semper inter frondis lobos terminale.

In *Marchantieis,* in *Ricciâ,* forsitàn omnibus in *Hepaticis,* etiam in *Anthocerote* nuperrimè observato calyptra officio insigni fungitur: junior enim globosa, plurimâ materie cellulosâ plena capsulam exiguam quasi centrum tenet. Augente capsulâ calyptræ parietes crassitudo minuitur et tandem nil nisi membrana tenuissima inflata remanet. Quare calyptra capsulam haud tantùm tegere sed juvenem nutrire videtur.

Marchantieœ per sexus manifestiores, quamvis intervallo longo, plantis phanerogamis, per *Lunulariœ* fructum, per *Hygropylœ* vegetationem *Jungermanniis* frondosis accedunt.

TABULARUM EXPLICATIO.

Tab. XII.

Fig. 1. *Marchantia androgyna.* *a.* Frondes. *b.* Porus auctus. *c.* Receptacula fœminea. *d.* Receptacula masculina. *e.* Calyptra, capsula, ejus pedicellus, semina et fila auct. *f.* Calyptræ stylus auct. *g.* Receptaculum fœmineum reversum. *h.* Pedunculi aucti sectio.

Fig. 2. *Marchantia chenopoda.* *a.* Frondes cum receptaculis fœmineis. *b.* Frondes cum receptaculis masculinis. *c.* Indusii squamæ. *d.* Squama seu stipula.

Fig. 3. *Marchantia paleacea.* *a.* Frondes cum receptaculis fœmineis. *b.* Frons cum receptaculis masculinis. *c.* Frons cum scyphis duobus. *d.* Capsula semina et fila effundens, auct. *e.* Calyx cum calyptræ stylo extante. *f.* Pedunculus basi squamosus.

Fig. 4. *Fegatella hemisphœrica.* *a.* Frons cum receptaculis fœmineis. *b.* Frons cum receptaculis masculinis. *c.* Receptaculum fœmineum reversum, auct. *d.* Calyptræ laciniæ relictæ ad capsulæ basin, auct.

Tab. XIII.

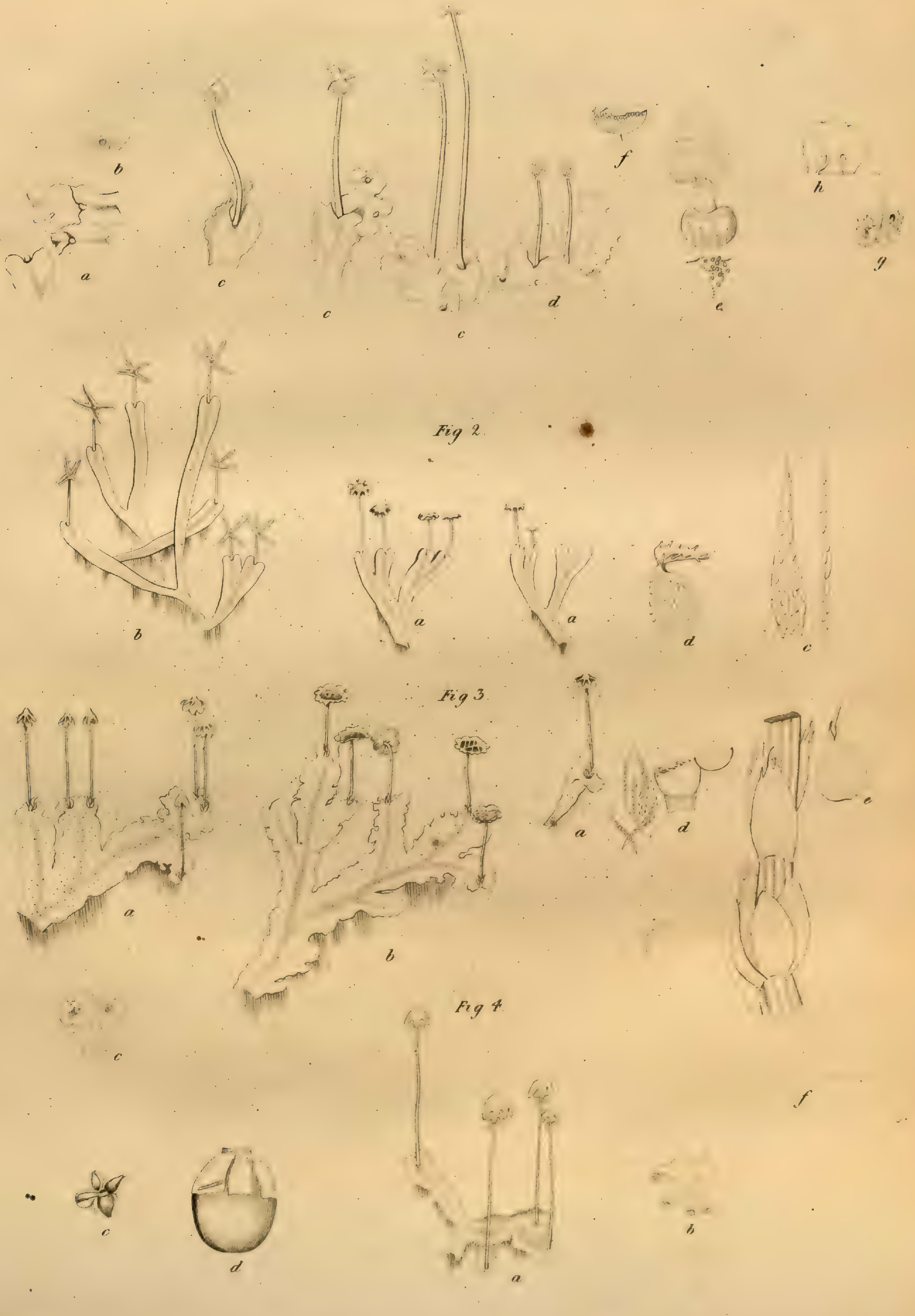
Fig. 1. *Fimbraria fragrans.* *a.* Frons cum receptaculo fœmineo. *b.* Eadem aucta. *c.* Capsula intra calyptram persistens, semina et fila, auct. *d.* Squamæ seu stipulæ.

Fig. 2. *Fimbraria tenella.* *a.* Frons cum receptaculis fœmineis. *b.* Squamæ seu stipulæ.

Fig. 3. *Fimbraria pilosa.* *a.* Frons cum receptaculo fœmineo. *b.* Eadem aucta. *c.* Indusii squamæ, auct. *d.* Squamæ seu stipulæ auctæ. *e.* Pedunculi aucti sectio.

Fig. 4. *Fimbraria nepalensis.* *a.* Frons cum receptaculis fœmineis. *b.* Receptaculum fœmineum, pedunculus atque indusium auct. *c.* Frondes cum receptaculis masculinis. *d.* Eadem auct. *e.* Calyptra cum stylo auct. *f.* Capsula intra calyptram arte discerptam auct. *g.* Semina et fila aucta. *h.* Squamæ seu stipulæ auct. *i.* Pedunculi aucti sectio.

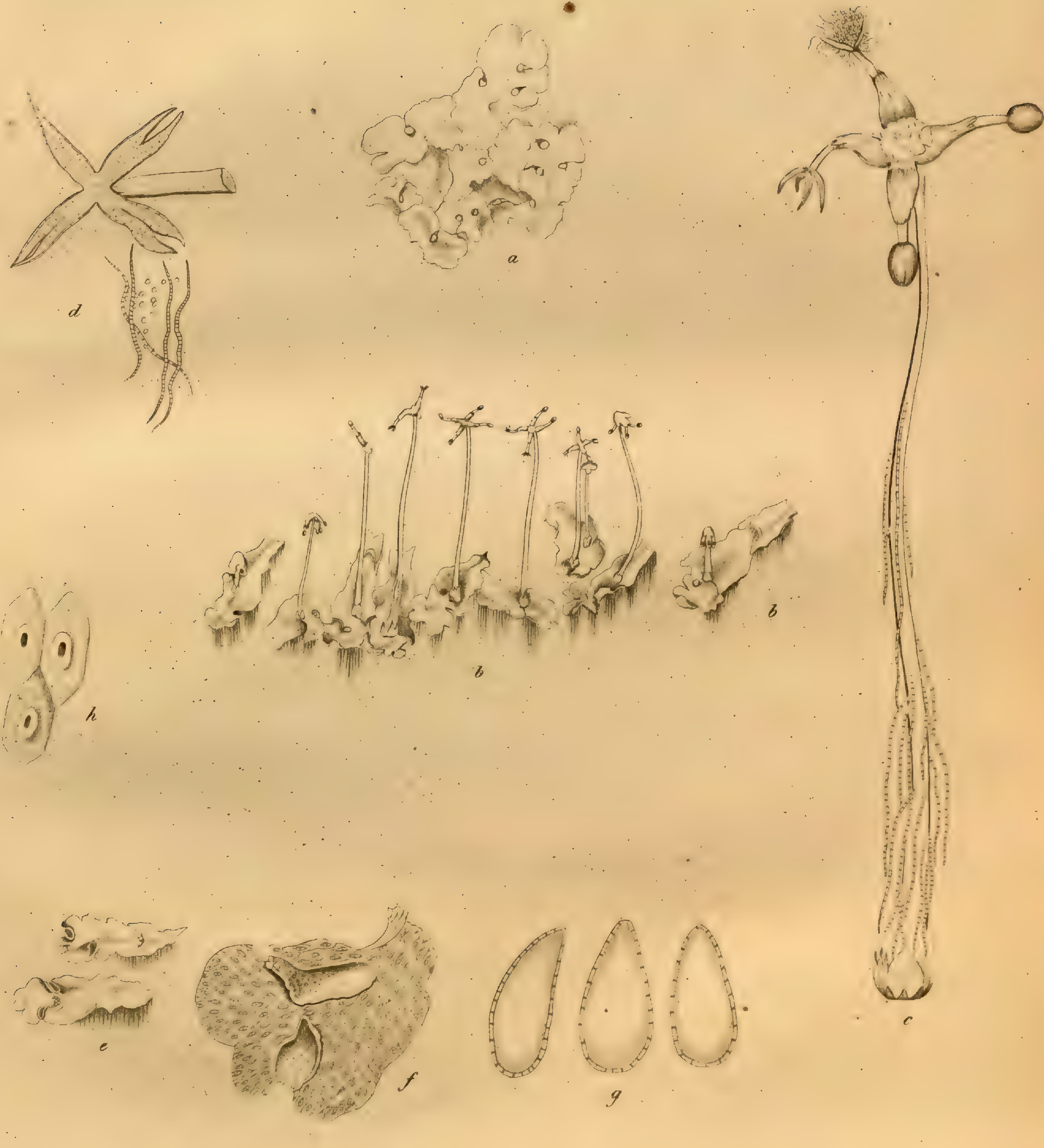
Fig 1.



Fredk W. Smith sculp.

Fred^k W. Smith sculp.

Fig 1.



Fred^k W. Smith Sculp.

Tab. XIV.

Lunularia vulgaris. *a.* Frondes cum receptaculis fœmineis juvenibus. *b.* Frondes cum receptaculis fœmineis. *c.* Receptacula fœminea cum pedunculo et indusio valdè aucta. *d.* Capsula ejusque pedicellus, semina et fila, aucta. *e.* Frondes cum receptaculis masculinis atque cum scyphis lunulatis. *f.* Frons cum receptaculis masculinis aucta. *g.* Antheræ auctæ. *h.* Pori aucti.

Tab. XV.

Fig. 1. *Hygropyla irrigua.* *a.* Frons cum receptaculis fœmineis magnitudine naturæ. *b.* Frons cum receptaculis masculinis. *c.* Receptaculum fœmineum auctum. *d.* Idem reversum. *e.* Calyptra et capsula exeuns, auctæ. *f.* Semina et fila aucta.

Fig. 2. *Hygropyla nepalensis.* *a.* Frondes cum receptaculis fœmineis. *b.* Receptaculum fœmineum auctum. *c.* Semina et fila aucta. *d.* Pedunculi aucti sectio.

XX. *On a new* Arachnide *uniting the Genera* Gonyleptes *and* Phalangium. *By the Rev.* F. W. Hope, *M.A., F.R.S. F.L.S.*

Read December 2nd, 1834.

Dr. MAXIMILIAN PERTY in his able work on Brazilian Insects has formed two grand divisions of *Phalangidæ,* and has given us the following characters, viz.

Divisio 1ma. Palpis spinosis, pedibus inæqualibus posticis et reliquis valdè remotis, femoribus incrassatis, abdomine plùs minùsve in cephalothorace occulto.

Divisio 2da. Palpis muticis, pedibus omnibus subæqualibus aut æqualibus, abdomine nunc occulto nunc libero.

As it is at first sight evident that the subject of the present paper can belong to neither of these divisions, partaking as it does of the characters of both, I may be allowed perhaps to suggest the adoption of a third division, viz.

Divisio 3tia. Palpis spinosis, pedibus inæqualibus posticis valdè elongatis, non à reliquis remotis, abdomine libero.

By means of this division, the genera *Cosmelus* and *Decosoma,* Perty, remain by themselves, and the genus *Phalangium* is united with *Dolichoscelis* the subject of the present notice, the characters of which are detailed at length.

Arachnida. Trachearia (*Lamarck*).

Fam. Phalangidæ.

Dolichoscelis*. *Hope.*

* From δολιχὸς *longus,* and σκέλος *crus.*

Character essentialis.

Mandibulæ chelatæ.

Palpi unguiculati, spinosi.

Pedes inæquales, posticè longissimi, præcedentibus haud remoti.

Character naturalis.

Corpus subtrigonum, depressum, angulis anticis subrotundatis, suprà tuberculatum, lateribus marginalibus incrassatis.

Caput anticè valdè emarginatum, vertice cornubus duobus basi externè oculigeris armato.

Oculi benè ferè rotundati.

Mandibulæ 2-articulatæ, pedunculo brevi affixæ, articulo 1mo trigono, apice dilatato, 2do subovato-chelato.

Palpi 5-articulati, incurvi, articulo 1mo minimo, 2do ferè triplò majori, internè subspinigero, 3tio dimidiam partem præcedentis vix æquanti, ad apicem incrassato, 4to subcylindrico, basi crassiore apiceque contracto, crebrisque aculeis setiformibus armato, ultimo subovato depresso spinoso, apice unguiculato, ungue longo incurvo acuto.

Pedes octo, anteriores brevissimi, proximè antecedentibus ferè triplò longiores, penultimi binis primis anticis duplò longiores; postici longissimi, non à reliquis remoti, binis anticis pedibus sextuplò longiores.

Tibiæ 3-articulatæ, articulo 1mo brevè incrassato, 2do longiori, 3tio longissimo.

Tarsi omnes unguiculati, in quatuor anterioribus unguibus internis obsoletis, undecim articulati, articulo 1mo quatuor sequentibus æquali, reliquis magnitudine decrescentibus.

Dolichoscelis Haworthii.

Tab. XVI.

Long. corp. lin. $3\frac{1}{2}$.
Lat. corp. anticè lin. 2., posticè lin. $2\frac{1}{2}$.

Flava; capite cornu utrinque oculigero erecto, pedibus posticis longissimis.

Caput valdè emarginatum, cornu utrinque oculigero erecto. *Oculi* obscuriores.

1
2
3
4
5

Corpus flavum, marginatum, margine exteriore elevato, interiore tuberculis luteis regulari serie ornato; subtùs concolor. *Discus* medio convexus, tuberculis luteis numerosis aspersus. *Abdomen* brevissimum, liberum. *Pedes* octo inæquales; postici longissimi, geniculis crassioribus, apicibusque femorum tibiarumque obscurioribus.

Habitat in Brasiliâ. In mus. Dom. Hope.

This *Arachnide* was one of the principal new forms contained in the collection of the late Adrian Hardy Haworth, Esq., a zealous promoter of entomology in all its branches, in respect to whose memory I have dedicated the species.

In *Mammalia*, when we find the thighs strong and incrassated, we naturally expect a leaping animal, as in the Kangaroo, Jerboa, and many of the *Rodentia*; so also amongst insects in the genera *Bruchus*, *Orchestes* and *Haltica*. Where the tibiæ are much developed, we have reason to expect swiftness in running, as in the Deer and Antelopes, and in the *Cicindelidæ*, and particularly in *Cicindela tenuipes*. In the present instance, however, we have no reason to expect great swiftness, as the hinder legs are disproportionately long, sufficient, indeed, to counteract that power. For what purpose, then, are the entire hind legs so much increased? I own I am at a loss to conjecture: it is possible, perhaps, that they may be prehensile organs of attachment while the animal attacks its prey with the fore legs. I mention this solely with the view of drawing attention to the subject.

EXPLANATION OF TAB. XVI.

Fig. 1. *Dolichoscelis Haworthii*, natural size.
2. Anterior cephalothoracic spines, with an eye at the base of each.
3. One of the anterior chelæ.
4. Underside of the body, with the base of the legs on one side.
5. Extremity of the hind leg.

XXI. *On the* Eriogoneæ, *a Tribe of the Order* Polygonaceæ. *By* GEORGE BENTHAM, *Esq., F.L.S.*

Read April 7th, 1835.

THE genus *Eriogonum* was first established by Michaux in his *Flora Boreali-Americana,* upon a Carolina plant distinguished from other *Polygonaceæ,* not so much by the organs of fructification, which are not very essentially different from those of *Rheum,* as by the involucrate inflorescence and the absence of the *ochreæ,* or sheathing stipules, observable in some shape or other in every other genus of the order. To the single species described by Michaux (*E. tomentosum*), Nuttall and Pursh added two others gathered by the former botanist in the plains of the Missouri (*E. flavum* and *E. pauciflorum*), and Smith in Rees's Cyclopædia described two more brought by Menzies from the coast of California (*E. latifolium* and *E. parvifolium*). These five North American species have now been increased to thirty-three by the discoveries of Mr. Douglass in New California and the North-west district, and of Mr. Nuttall, Dr. Torrey, Mr. Drummond, and others, in the Rocky Mountains, Arkansa territories, and province of Texas; and all are equally distinguished by their involucrate inflorescence and absence of stipulæ, at least to the lower or true cauline leaves. But a considerable difference in habit has induced me not only, at the suggestion of Mr. Brown, to separate generically five species with uniflorous involucres, but, amongst these, to isolate one (*Mucronea*), which has a compressed and bidentate involucre formed of two leaves, instead of a triangular sexdentate one formed of six leaves, as in the other four species (*Chorizanthe,* Br.). The latter genus is further confirmed and augmented by seven species collected in Chili by Macrae, Cuming, Bridges, &c., giving a total of forty species comprised in the three genera.

The whole of these plants have all the essential characters of *Polygonaceæ,* thus stated by Brown (*Prodr.* p. 418):

" *Perianthium* monophyllum, divisum, æstivatione imbricatâ. *Stamina* definita, imo perianthio inserta. *Antherarum* loculi longitudinalitèr dehiscentes. *Ovarium* liberum, monospermum, ovulo erecto. *Styli* vel *stigmata* plura. *Nux* (*achenium*) nuda vel perianthio tecta. *Albumen* farinaceum, raró subnullum. *Embryo* inversus, sæpè unilateralis. *Plumula* inconspicua."

Taking the involucrum as the essential character of the *Eriogoneæ*, they will be found also to agree in the following particulars:

Herbæ suffruticesve sæpissimè lanuginosæ. *Folia* caulina alterna, ad basin caulis approximata, cæspitosa vel secus ramos fasciculata, exstipulata, petiolo basi dilatato sæpiùs amplexicauli vel vaginante. *Pedunculi* vel *rami* floriferi terminales, nunc simplices involucro solitario terminali, sæpiùs 2—3-chotomè vel umbellatìm ramosi, involucris solitariis glomeratisve intra ramificationes secus ramos vel ad apices sessiles vel pedicellati. *Bracteæ* vel *folia* ramorum floralium sub ramificationes orta, tot quot rami vel (ramis abortientibus) numerosiora, nunc minuta squamæformia, nunc herbacea at foliis caulinis difformia, sæpissimè sessilia, exstipulata vel rariùs stipulis scariosis aucta. *Involucrum* monophyllum, tubulosum, campanulatum vel subcyathiforme, apice 2—6-dentatum, 1—multi-florum. *Flores* hermaphroditi vel rariùs dioici, in involucro pedicellati, cum bracteolis setaceis sæpè intermixti. *Perianthium* simplex, profundè 6-fidum, laciniis 3 exterioribus, 3 interioribus. *Stamina* 9, basi subcoalita. *Ovarium* triquetrum. *Styli* 3, filiformes. *Stigmata* terminalia, tenuia vel parùm incrassata, capitata. *Achenium* triquetrum vel vix trialatum.

From the above description it will appear that there are considerable differences in habit between *Eriogoneæ* and the rest of *Polygonaceæ*; yet when we observe an approach to the dichotomous or verticillate inflorescence in several *Polygona* (*Aconogona* and *Cephalophila*) and *Kœnigia*; the resemblance between the stipules of *Polygona* (*Aviculariæ*) and those of *Eriogonum angulosum*; the very great analogy between the organs of fructification in *Rheum* and the *Eriogoneæ*, and that even in regard to the involucres, the ochreæform bracts* of many *Polygona* (*Persicariæ*) may be assimilated to the involucra of

* See Meisner, *Monogr. Gen. Polygoni*, p. 22.

Eriogonum vimineum, it will be admitted that the two series cannot be otherwise considered than as forming one natural order. The medical properties of several species of *Eriogonum* (called in America Wild Rhubarb) are also known to have much similarity to those of *Rheum.*

Meisner, in his above-quoted monograph of *Polygonum,* in speaking of the number of parts in the organs of fructification of that genus, follows De Candolle in considering the normal number of stamina to be double that of the lobes of the perianthium, and the several variations observable in the different species to be due to the abortion of stamina only. There appear, however, to be several objections to this theory. It is not probable that in an order varying as much in the number of lobes of the perianthium as in that of the stamina, the number of lobes nevertheless should be constantly normal, whilst there is as constant a reduction of number in the stamina, and in those genera where the flowers are perfectly regular in their arrangement (as in *Rheum, Eriogonum,* &c.), the symmetry would be disturbed by the insertion of the stamina requisite to make up the number. I should rather suggest that, in the great mass of *Polygonaceæ,* the normal arrangement of all the parts of the flower is ternary, as follows:

Perianthium double, three external and three internal segments.

Stamina in three rows, of three each, those of the external row alternating with the internal segments of the perianthium, those of the central row opposed to them, and the inner ones again alternating with them. In most cases, however, these three rows are so closely connected as to give the appearance of nine stamina in a single row.

Gynæcium single. Ovarium triangular, with three styles and stigmata.

The different reductions from the above number will be better understood from the accompanying sections, copied chiefly from the plates in Meisner's monograph. Thus in *Rheum* and the *Eriogoneæ* (TAB. XVII. fig. 1.) we have the regular normal state above described. In *Rumex* (TAB. XVII. fig. 2.) the ternary arrangement still prevails, but the central row of stamina being wanting, the total number is reduced to six, whilst the other parts of the flower remain complete. In *Atraphaxis* (TAB. XVII. fig. 3.) the flower is still regular, and the number of stamina, as in *Rumex,* is only six, but the reduction is

owing to a general substitution of the binary for the ternary arrangement; two external and two internal segments of the perianthium, two stamina in each row, two styles and stigmata with a biangular ovarium. In *Kœnigia* (Tab. XVII. fig. 4.) there is a still further although regular reduction; the inner segments of the perianthium and two rows of stamina are wanting, leaving a perianthium with three segments opposed to the angles of the ovarium, three stamina opposed to its faces (occasionally reduced to two), and a triangular ovarium with three styles and stigmata. According to the same principle the *Polygona* will be found to be always irregular, there being a constant contraction of the upper side of the flower (next to the axis of the plant). Thus in the common pentamerous octandrous species, either the upper external segment of the perianthium is wanting, the two upper internal ones are brought close together, and one of their stamina is wanting (Tab. XVII. fig. 5.); or the external segments remaining complete, one of the upper internal ones with one of the corresponding stamina is deficient (Tab. XVII. fig. 6.), the gynæcium in both cases remaining complete; whilst in the hexandrous and pentandrous species (Tab. XVII. fig. 7, 8, 9.) there is a further reduction in the upper internal segments of the perianthium and in the upper stamina, and the gynæcium becomes dimerous, the upper faces of the ovarium with their styles and stigmata being reduced to one.

The flowers of *Calligonum*, where (in the specimens I possess of *C. Pallasii*) the lobes of the perianthium are 5, the stamina 12, and the gynæcium tetramerous, are evidently irregular. Their normal state may possibly be pentamerous, 5 external and 5 internal segments of the perianthium, 15 stamina in three rows of 5 each, and a 5-angular ovarium, with 5 styles and stigmata. In support of this opinion it may be mentioned that Ledebour (*Fl. Alt.* ii. 207.) states that the number of styles varies frum 2 to 5: it has long been observed that the number of stamina is also variable, not exceeding 15; and in one of the flowers I opened from my own specimens there were four inner and two outer lobes of the perianthium. The stamina being connected at the base appear in this, as in other *Polygonaceæ*, arranged in a single series.

The following are the leading subdivisions I should propose in the Eriogoneæ.

I. Involucrum multiflorum. Eriogonum.

Folia ramorum floralium stipulata: § 1. Stipulata (*E. angulosum*).

Folia omnia exstipulata.

Genitalia pilosa.

Inflorescentia dichotoma: § 2. Eriantha (*E. longifolium, tomentosum*).

Inflorescentia umbellata: § 3. Umbellata.

*Perianthia villosa: (*E. sphærocephalum, flavum, crassifolium, cæspitosum*).

**Perianthia glabra: (*E. pauciflorum, ovalifolium, stellatum, umbellatum, heracleoides, compositum*).

Genitalia glabra.

Involucra multiflora, sæpiùs glomerata, perianthii laciniæ subæquales.

Folia parva, secus ramos fasciculata: § 4. Fasciculata (*E. parvifolium, fasciculatum*).

Folia longè petiolata, ad basin caulis approximata: § 5. Latifolia (*E. oblongifolium, latifolium, auriculatum, nudum, elatum*).

Involucra parva, secus ramos paniculæ 2—3-chotomæ solitaria, perianthii laciniæ exteriores acutæ: § 6. Micrantha (*E. multiflorum, annuum, strictum, niveum, dichotomum, decumbens, tenellum, vimineum*).

II. Involucrum uniflorum, sexdentatum. Chorizanthe.

§ 1. Suffruticosæ (Chilenses): (*C. virgata, peduncularis, Macræi, ramosissima, paniculata, vaginata, glabrescens*).

§ 2. Herbaceæ (Californicæ): (*C. staticoides, Douglasii, membranacea, pungens*).

III. Involucrum uniflorum, bidentatum. Mucronea (*M. Californica*).

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1. Eriogonum (*Mich.*).

Involucrum tubulosum, campanulatum vel cyathiforme, vix angulatum, subæqualitèr 6-dentatum, multiflorum. *Receptaculum* bracteolis intra pedicellos instructum. *Perianthia* exserta, profundè 6-fida.

§ 1. Stipulata. *Folia caulina nuda, ramorum floralium stipulata.*

1. E. angulosum, ramis floriferis erectis dichotomis vel verticillatìm ramosis foliosis, foliis inferioribus alternis petiolatis exstipulatis, ramorum floralium oppositis verticillatisve basi stipulatis, omnibus oblongo-linearibus subtùs vel utrinque lanuginosis demùm ramisque glabratis, involucris numerosis parvis pedicellatis hemisphæricis glabriusculis. Tab. XVIII. fig. 1.

California. *Douglas.* (*v. s.*)

This is in many respects a very remarkable species. The lower leaves are collected at the bottom of the stem, and resemble in form those of *E. heracleoides, flavum,* &c., and like them have no stipules. The mode of ramification of the flowering branches is also upon the same principle as in other *Eriogona* (although the ramifications commence from the base of the stem), but the leaves, which are placed under the branches, corresponding in number to them, have at the basis of each of them a pair of brown scariose stipules, not forming a sheath round the stem as in most *Polygonaceæ*, but connate at their base *outside* the leaves, and loose at the apex, so as to resemble in some measure the stipules of the *Polygona Aviculariæ.* The flowering branches are remarkably angular, about a foot high; the peduncles slender, and about half an inch long; the heads of flowers of the form of those of *Galinsogea parviflora,* but smaller. The little bracts inside the involucre are dilated at the apex, membranaceous on the edge, and bear long woolly hairs on their outer surface. The perianth, ovarium and stamina are glabrous. In some, especially the dichotomous specimens, one pedicel at the axis of each ramification bears only a small abortive involucrum.

§ 2. Eriantha. *Folia omnia exstipulata. Genitalia pilosa. Inflorescentia dichotoma.*

2. E. longifolium (*Nutt. in Trans. Amer. Phil. Soc.* v. 164.), caule erecto basi folioso, foliis oblongo-linearibus basi longè angulatis subtùs albo-tomentosis, superioribus parvis, paniculâ amplâ 2—3-chotomè ramosissimâ, bracteis minutis, involucris solitariis pedicellatis campanulatis multifloris perianthiisque extùs lanatis.

Arkansa. *Nuttall.* Texas. *Drummond.* (*v. s.*)

Caules stricti, plùs minùsve tomentosi, elati. *Folia* inferiora cæspitosa, 3—4-pollicaria, suprà mollitèr villosa, superiora remota, solitaria vel subfasciculata, ramorum floralium minuta, bracteæformia. *Rami paniculæ* et *pedicelli* rigida. *Bracteæ* subulatæ, glabriusculæ. *Ovarium* villosissimum. *Stamina* ferè glabra.

Nuttall's specimens are much more woolly, and the panicle much larger than in Drummond's; but both appear to belong to the same species.

3. E. tomentosum (*Mich. Fl. Bor. Amer.* i. 246. *t.* 24.), foliis ad basin caulis approximatis spathulato-obovatis oblongisve subtùs lanatis, ramis floriferis 2—3-chotomè ramosis lanatis ternatìm verticillatìmve foliosis, involucris solitariis sessilibus campanulatis rufo-lanatis laxè multifloris, perianthiis extùs lanatis.

Carolina and Georgia. *Michaux, Fraser.* (*v. s.*)

Species habitu et inflorescentiâ distinctissima. *Lana* in foliorum paginâ inferiore ramis involucris perianthiisque densa, sæpiùs rufescens. *Folia* ramorum floralium ovata, obovata vel oblonga. *Involucra* alia in dichotomiis vel secus ramos sessilia, alia terminalia, subcyathiformia. *Bracteolæ* setaceæ, densè plumosæ. *Perianthia* longiusculè exserta, laciniis anterioribus longioribus. *Filamenta* basi et ovarium apice pilosa. *Flores* (sec. *Mich.*) candicantes.

§ 3. Umbellata. *Folia omnia exstipulata. Genitalia pilosa, filamenta prope basin, ovarium apicem versus. Inflorescentia umbellata, pedunculo (sæpè scapiformi) apice umbellam simplicem vel duplicem pluri-radiatam, nonnunquàm in capitulum globosum contractam vel ad involucrum solitarium reductam, gerente.*

4. E. sphærocephalum (*Dougl. MSS.*), caule ramoso folioso, foliis fasciculatis verticillatisve oblongis basi angulatis subtùs albo-lanatis, pedunculis subsimplicibus, involucro subsolitario latè campanulato tomentoso multifloro, perianthiis extùs sericeo-pilosis.

Columbia river. *Douglas.* (*v. s.*)

Fruticulus irregularitèr ramosus. *Folia* ad ramificationes sæpiùs fasciculata, petiolis basi dilatatis imbricatis, in ramis verticillata vel pauca remota

alterna. *Involucra* rariùs bina, brevitèr pedunculata, sæpiùs solitaria (ramis cæteris umbellæ abortientibus). *Flores* in involucro numerosissimi, exserti, capitulum globosum formantes. *Perianthia* flava (?) omninò *E. flavo* similia, at minùs villosa.

5. E. flavum (*Nutt. in Fras. Catal.*), foliis ad basin caulis approximatis spathulato-obovatis oblongisve subtùs vel utrinque albo-lanatis, pedunculo apice brevitèr umbellato, involucris ad apices radiorum solitariis latè campanulatis lanatis multifloris, perianthiis sericeo-villosis.

E. sericeum, Pursh, Fl. Amer. Sept. i. 277.

Missouri. *Nuttall.* Interior of North-west America. *Douglas.* (*v. s.*)

Habitu et inflorescentiâ *E. umbellato,* floribus *E. sphærocephalo* affine. *Pedunculus* semipedalis, vel parùm longior. *Umbella* 4—8-radiata. *Perianthia* longiusculè exserta, basi attenuata, cum pedicellis densè sericeo-villosa, flava: *laciniæ* interiores post anthesin exterioribus longiores.

6. E. crassifolium, caule brevissimo incrassato vaginis foliorum villosissimis obtecto, foliis radicalibus petiolatis oblongis basi longè angustatis crassis suprà tomentoso-pubescentibus subtùs albo-lanatis, scapo apice brevitèr umbellato, involucris sessilibus vel ad apices radiorum solitariis campanulatis lanatis multifloris, perianthiis sericeo-villosis.

Rocky Mountains. *Drummond.* (*v. s.*)

Habitu *E. cæspitoso* affine, sed duplò major. Ab *E. flavo* habitu diversum. *Rami* steriles nulli (?). *Radix* crassa, rubens. *Folia* omnia radicalia, vaginis dilatatis imbricatis pilis longis albis omninò obtectis. *Scapus* subsemipedalis, nudus. *Bracteæ* sub umbellâ oblongo-lineares, foliaceæ. *Involucra* crassiuscula, densè lanata. *Flores E. flavi.*

7. E. cæspitosum (*Nutt. in Journ. Acad. Nat. Sc. Philad.* vii. 50. *t.* 8. *f.* 2.), caule brevissimo vaginis foliorum glabriusculis obtecto, foliis radicalibus oblongo-linearibus basi longè angustatis suprà levitèr subtùs densè albo-tomentosis, scapo apice brevitèr umbellato, involucris sessilibus vel ad apices radiorum solitariis campanulatis lanatis.

Rocky Mountains. *Nuttall, Drummond.* (*v. s.*)

Herba parvula, densè cæspitosa. *Radix* crassa, rubens. *Foliorum* limbus vix semipollicares. *Scapus* nunc, ut in icone Nuttallianâ, vix bipollicaris, nunc 4—5-pollicaris, laxè tomentosus. *Bracteæ* sub umbellâ oblongæ, floribus breviores. *Perianthia* longiusculè exserta, laciniis interioribus vix longioribus.

8. E. pauciflorum (*Pursh, Fl. Amer. Sept.* ii. 735.), foliis ad basin caulis approximatis oblongo-linearibus subtùs vel utrinque albo-lanatis, pedunculis apice capituliferis, involucris plurimis sessilibus tubulosis tomentosis paucifloris, perianthiis glabris.

E. parviflorum, Nutt. Gen. i. 161.

Upper Louisiana. *Bradbury*. (*v. s.*)

Statura pusilla. *Caulis* basi cæspitosus, sublignosus. *Pedunculus* terminalis, 2—4-pollicaris. *Capitulum* parvum, densum, involucris circitèr octo. *Perianthia* vix exserta. *Genitalia* pilosa (?).

9. E. ovalifolium (*Nutt. in Journ. Acad. Nat. Sc. Philad.* vii. 50. *t.* 8. *f.* 1.), foliis ad basin caulis approximatis subrotundo-ovalibus basi in petiolum angustatis utrinque densè albo-lanatis, involucro ad apicem pedunculi solitario globoso multifloro vel paucis sessilibus, perianthiis glabris vel basi vix pubescentibus.

Source of the Missouri. *Nuttall.* Interior of North-west America. *Douglas.* (*v. s.*)

Suffrutex humilis, basi ramosissimus, cæspitosus. *Folia* vix cum petiolo semipollicaria. *Pedunculus* 3—4-pollicaris, cano-lanatus, ad medium verticillo foliorum oblongo-linearium instructus. *Capitulum E. sphærocephali* sed perianthia ferè glabra.

10. E. stellatum, foliis ad basin caulis approximatis ovalibus basi in petiolum longè angustatis suprà glabriusculis subtùs canescentibus, pedunculo apice simplicitèr vel bis umbellato, involucris in umbellulâ paucis villosulis sex-fidis, laciniis lanceolatis tubo longioribus reflexo-patentibus, perianthiis glabris.

Interior of North-west America. *Douglas.* (*v. s.*)

Habitus ferè *E. umbellati*, sed humilius, et minùs tomentosum. *Folia* latiora. *Bracteæ* sub umbellâ umbellulisve oblongæ, glabriusculæ. *Laciniæ* involucrorum flores subsuperantia. *Perianthia* brevitèr pedicellata.

11. E. umbellatum (*Torrey in Ann. Lyc. Nat. Hist.* ii. 241.), foliis ad basin caulis approximatis oblongo-linearibus subtùs vel utrinque albo-lanatis, pedunculo apice umbellato, involucris ad apices radiorum solitariis latè campanulatis lanatis multifloris dentibus tubo brevioribus, perianthiis glabris. Tab. XVIII. fig. 2.

Interior of North-west America. *Douglas.* Rocky Mountains. *Torrey.* (*v. s.*)

Rami steriles sub insertione pedunculi plurimi, subverticillati, breves, apice fasciculatìm vel verticillatìm foliosi. *Pedunculi* spithamæi, infra umbellam nudi. *Bracteæ* sub umbello oblongæ. *Radii umbellæ* constantèr simplices, 4—8, uti involucra lanati. *Perianthia* exserta, flava (?), laciniis inter se subæqualibus. *Stigmata* crassiuscula.

12. E. heracleoides (*Nutt. in Journ. Acad. Nat. Sc. Philad.* vii. 49.), foliis ad basin caulis approximatis spathulato-oblongis subtùs albo-lanatis, pedunculo elongato apice biumbellato, involucris in umbellulâ plurimis pedicellatis latè campanulatis lanatis multifloris, perianthiis glabris.

Sources of the Missouri. *Nuttall.* Columbia river above the Kettle Falls. *Douglas.* (*v. s.*)

Ab *E. umbellato* differt staturâ elatiore, foliis latioribus et umbellis compositis. *Pedunculus* scapiformis, sæpiùs ultrapedalis, verticillis foliorum uno alterove instructus. *Flores* omninò *E. umbellati.*

13. E. compositum (*Dougl. MSS.*), foliis ad basin caulis approximatis longè petiolatis ovatis basi rotundatis cordatisve suprà demùm glabratis subtùs densè albo-lanatis, pedunculo longissimo nudo apice brevitèr biumbellato, involucris brevitèr pedicellatis campanulatis multifloris. Tab. XVII. fig. 10.

Columbia river. *Douglas.* (*v. s.*)

Habitu et foliis *E. latifolio* affine, inflorescentiâ ad *Umbellatorum* sectionem referendum, floribus inter *Umbellata* et *Micrantha* medium. *Petioli* basi vaginantes, extus villosissimi, 2—4-pollicares, limbo 1—1½-pollicari. *Pe-*

dunculus scapiformis ultrapedalis, in exemplaribus cultis folio sæpè instructus. *Bracteæ* sub radiis umbellæ lineares, oblongæ, vel (in exemplis cultis) dilatato-ovatæ. *Radii umbellæ* 1½—3-pollicares, umbellulorum vix semipollicares, villosuli. *Flores* majores quàm in *E. latifolio. Genitalia* minùs pilosa quàm in præcedentibus. *Perianthia* post anthesin aucta, laciniæ interiores elongatæ obovatæ, exteriores breviores latiores, marginibus membranaceis crispis.

§ 4. Fasciculata. *Folia omnia exstipulata. Genitalia glabra. Involucra multiflora sæpiùs in capitulis glomerata. Capitula solitaria vel secus ramos pedunculi plura. Folia parva secus ramos fasciculata. Perianthia glabra.*

14. E. parvifolium (*Sm.! in Rees Cycl.*), fruticulosum, foliis brevissimè petiolatis ovatis margine revolutis undulatis subtùs lanatis, involucris sublanatis.

Upper California. *Menzies, Douglas.* (*v. s.*)

Folia ¼—½-pollicaria, basi truncata vel subcordata. *Pedunculi* omnes simplices vel terminalis ramosus. *Capitula* pauca lateralia et terminalia, fructifera rubescentia. *Bracteæ* sub capitulo paucæ, parvæ, ovatæ vel oblongæ. *Involucra* in capitulo plurima, sessilia, tubuloso-campanulata. *Bracteolæ* intra involucrum plumosæ. *Perianthii laciniæ* inter se subæquales.

✓ 15. E. fasciculatum, fruticulosum, foliis oblongo-ellipticis linearibusve basi angustatis margine revolutis glabris vel subtùs tenuitèr albo-tomentosis, involucris glabriusculis.

Upper California. *Menzies, Douglas.* (*v. s.*)

Folia ½—¾-pollicaria, demùm glabra. *Pedunculi* longiores quàm in *E. parvifolio*, terminalis sæpissimè umbellifer, radiis 2—3 inæqualitèr elongatis, 1—2 brevissimis vel uno alterove intra radios sessilibus. *Bracteæ* sub capitulis numerosæ, oblongo-lineares. *Bracteolæ* intra involucra minutissimæ. *Involucra* et *flores E. parvifolii.*

§ 5. Latifolia. *Folia omnia exstipulata. Genitalia glabra (vel filamenta rariùs basi vix pubescentia). Involucra multiflora, sæpiùs in capitulis glomerata.—Suffrutices. Folia longè petiolata, ad basin ramorum approximata. Pedunculi scapiformes, elongati, subnudi, apice irregularitèr 2—3-chotomè vel subumbellatìm ramosi, rariùs simplices. Perianthia glabra.*

16. E. oblongifolium, foliis oblongo-ovatis basi angustato-rotundatis suprà villosulis subtùs albo-lanatis, petiolis basi dilatatis nudis, capitulis lateralibus terminalibusque, involucris in capitulo 3—6 sessilibus campanulatis glabris vel apice vix lanatis multifloris.

Upper California. *Douglas.* (*v. s.*)

Ab *E. latifolio* diversum videtur foliorum formâ, involucris minoribus ferè glabris, et bracteolis brevioribus vix plumosis. Pedunculi rarissimè simplices, sæpiùs apice umbellati.

17. E. latifolium (*Sm.! in Rees Cycl.*), foliis ovatis basi rotundatis vel subcordatis suprà arachnoideo- subtùs densè lanatis, petiolis basi dilatatis nudis, capitulis in pedunculo solitariis vel paucis, involucris in capitulo 2—6 sessilibus campanulatis lanatis multifloris, bracteolis demùm exsertis densè plumosis.

E. arachnoideum, Eschsch.! in Mem. Acad. Sc. Petrop. vol. 10.

Upper California. *Menzies, Eschscholtz, Chamisso, Douglas.* (*v. s.*)

Habitus ut in speciebus affinibus valdè variabilis, sed (præter foliorum formâ) involucris albo-lanatis et bracteolis longis rufo-plumosis facilè recognoscendum. Pedunculi etiam sæpiùs breviores simplices et capitula majora. Exemplaria Eschscholtziana non diversa videntur à Menziesianis.

18. E. auriculatum, foliis ovatis margine undulatis basi rotundatis vel subcordatis crassiusculis suprà arachnoideo-lanatis demùm glabris subtùs albo-lanatis, petiolis basi sæpiùs auriculato-dilatatis, ramis pedunculi glaucescentis pluribus rigidis, capitulis lateralibus terminalibusque, involucris in capitulo 3—4 sessilibus campanulatis glabris.

Upper California. *Douglas.* (*v. s.*)

Ab *E. latifolio* differt imprimis pedunculo elatiore ramosiore glaucescente

nec ad ramificationes lanato, ramis crassioribus rigidioribus, capitulis minoribus lanâ ferè omninò destitutis. Bracteolæ brevitèr plumosæ.

19. E. nudum (*Dougl. MSS.*), foliis ovatis margine undulatis basi rotundatis vel subcordatis suprà arachnoideo-lanatis demùm glabris subtùs albo-lanatis, pedunculo 2—3-chotomè paniculato, capitulis lateralibus terminalibusque involucris in capitulo 1—3 sessilibus tubuloso-campanulatis glabris, bracteolis vix plumosis.

E. arachnoideum. *Hook. et Arn. Bot. of Beech. Voy. p.* 158. non *Eschsch.*

Plains of the Multoonah. *Douglas.* California. *Beechey.* (*v. s.*)

Ab *E. latifolio* differt glabritie et inflorescentiâ. Bracteæ sub involucris et ramificationibus breves, ovatæ. Involucri dentes breves, obtusi. Bracteolæ setaceæ, vix exsertæ. Perianthii laciniæ subæquales.

20. E. elatum (*Dougl. MSS.*), foliis amplis oblongis undulatis suprà villosulis subtùs velutinis, involucris glomeratis pedicellatis tubuloso-campanulatis glabris.

Columbia river. *Douglas.* (*v. s.*)

Folia inferiora multò majora quàm in cæteris speciebus (4—6-pollicaria) et vix subtùs canescentia. *Pedunculus* ut in præcedentibus scapiformis, sesquipedalis, ramis 2—3-chotomis vel irregularitèr umbellatis, at involucra glomeratìm pedicellata, nec capitata. *Pedicelli* inæquales. *Bracteæ* sub involucris parvæ, ovatæ. *Bracteolæ* intra involucra setaceæ, glabræ. *Perianthia* brevitèr exserta, glabra, laciniis inter se subæqualibus. *Genitalia* glabra.

§ 6. Micrantha. *Folia omnia exstipulata. Genitalia glabra* (*vel filamenta basi pilis paucis donata*). *Involucra solitaria, intra ramificationes secus ramos vel ad apices ramorum pedunculi* 2—3-*chotomi disposita. Perianthia glabra, laciniis exterioribus majoribus. Species pleræque* (*an omnes?*) *dioicæ vel polygamæ.*

21. E. multiflorum, caule erecto elato ramoso, foliis sessilibus oblongo-lanceolatis undulatis suprà arachnoideo- subtus albo-lanatis pedunculo apice 2—3-chotomè ramosissimo corymboso, involucris glabriusculis.

Texas. *Drummond.* (*v. s.*)

Caulis cum pedunculo ultrà sesquipedalis, laxè arachnoideo-tomentosus. *Folia* acuta, bipollicaria, inferiora longiora. *Pedunculi* semipedales et longiores subnudi. *Rami* paniculæ divaricati. *Involucra* parva, numerosa, pedicellata, campanulata. *Bracteolæ* paucæ, plumosæ. *Perianthia* brevitèr exserta, parva, glabra, laciniæ exteriores post anthesin membranaceo-dilatatæ, rotundatæ, basi cordatæ, interiores parvæ oblongo-lineares. *Filamenta* (in exempl. meo fœmineo sterilia) basi pilis paucis longis uti laciniæ interiores perianthii lanata. *Ovarium* glabrum.

22. E. annuum (*Nutt. in Trans. Amer. Phil. Soc.* v. 164.), erectum, annuum, foliis oblongis basi angustatis, pedunculo albo-lanato apice 2—3-chotomè ramoso, involucris campanulatis niveo-lanatis multifloris.

Arkansas. *Nuttall.* Rocky Mountains. *Torrey.* (*v. s.*)

Caules subsimplices, pedales et ultrà. *Folia* ferè *E. nivei*, ad axillas nonnunquàm fasciculata. *Pedunculi* semipedales, terminales, nudi. *Panicula* multiflora, corymbosa. *Bracteæ* minutæ. *Involucra* pedicellata. *Bracteolæ* piliformes, paucæ. *Perianthia* brevitèr exserta, parva, glabra, submembranacea; laciniæ exteriores ovatæ, basi angustatæ, interiores oblongæ. *Filamenta* basi subpilosa.

23. E. strictum, suffruticosum, foliis parvis oblongo-ovatis basi in petiolum longè angustatis subtùs vel utrinque albo-lanatis, pedunculis strictis gracilibus subglobosis, involucris parvis sessilibus terminalibusque paucifloris glabriusculis, dentibus brevissimis subæqualibus.

Columbia river. *Douglas.* (*v. s.*)

Suffrutex basi cæspitosus, densè foliosus. *Pedunculi* scapiformes, juncei, pedales et ultrà, basi simplices, nudi, à medio 2—3-chotomi, ramis omnibus strictis rigidis erectis tenuibus. *Bracteæ* parvæ, lineares. *Involucra* pauca, secus ramos sessiles, pleraque ad apices ramorum terminalia, vix lineam longa. *Perianthia* exserta, laciniis exterioribus demùm valdè auctis.

24. E. niveum (*Dougl. MSS.*), suffruticosum, foliis oblongis basi angustatis, pedunculoque albo-lanatis, bracteis patentibus, involucris tenuibus niveis paucifloris sessilibus, dentibus alternis minutis.

Valleys of the Blue Mountains. *Douglas.* (*v. s.*)

Suffrutex basi cæspitosus, foliosus. *Folia* ferè *E. flavi.* *Pedunculi* scapiformes, pedales, basi simplices, nudi vel rariùs verticillo foliorum infra ramificationes instructi, apice ramosi, ramis gracilibus. *Bracteæ* subfoliaceæ, oblongo-lineares, sub involucro plerumque floribus vix breviores recurvo-patentes. *Involucra* vix sesquilineam longa, tubulosa, densè lanata, dentibus tribus minutis, tribus parùm longioribus patentibus. *Bracteolæ* intra involucrum setaceæ, nudæ.

25. E. dichotomum (*Dougl. MSS.*), suffruticosum, foliis oblongis basi angustatis pedunculoque albo-lanatis, bracteis brevibus appressis, involucris crassiusculis densè lanatis plurifloris sessilibus, dentibus brevibus subæqualibus.

Columbia river. *Douglas.* (*v. s.*)

Affine *E. niveo,* sed rigidus, strictus. *Bracteæ* involucro dimidiò breviores, appressæ. *Involucra* tubulosa, duplò majora quàm in *E. niveo.* *Flores* exserti, magnitudine ferè *E. compositi.* *Filamenta* basi pilis paucis donata. *Ovarium* glaberrimum.

26. E. decumbens, suffruticosum, foliis ovatis longè petiolatis utrinque cano-tomentosis, pedunculi ramis flexuosis floccoso-lanatis, bracteis involucrum æquantibus patentibus, involucris crassiusculis densè lanatis plurifloris sessilibus, dentibus recurvo-patentibus alternis minutis.

Columbia river. *Douglas.* (*v. s.*)

Rami foliiferi elongati, duri, densè tomentosi. *Folia* pollicaria, petiolo 1—2-pollicari. *Bracteæ* inferiores oblongæ, foliaceæ, ultrà pollicares, superiores lineares. *Involucra* formâ ferè *E. nivei,* magnitudine *E. dichotomi.* *Flores* magnitudine *E. compositi.* Species habitu distinctissima.

27. E. tenellum, "caule nudo dichotomo gracili glaberrimo, ramis elongatis apice fasciculum florum gerentibus, floribus minutissimis, calycis laciniis subrotundis obtusis glabris, foliis ovatis subcordatis subtùs (junioribus utrinque) niveo-tomentosis suprà pubescentibus."—*Torrey in Ann. Lyc. Nat. Hist.* ii. 241.

Rocky Mountains. *Torrey.*

28. E. vimineum (*Dougl. MSS.*), annuum, foliis subradicalibus petiolatis ovatis subtùs tomentosis, pedunculis scapiformibus divaricato-ramosissimis apice involucrisque glaberrimis.

Columbia river. *Douglas.* (*v. s.*)

Pedunculi scapiformes, complures, basi sublanati, erecti, 6—8-pollicares. *Rami* tenues, virgati. *Involucra* tenuia, cylindrica, sessilia, dentibus brevibus obtusis subæqualibus. *Perianthia* brevitèr exserta, laciniæ exteriores per anthesin patulæ, obovatæ, interiores erectæ dimidiò angustiores.

II. Chorizanthe (*R. Br.*).

Involucrum tubulosum, triangulare, uniflorum, sexdentatum, dentibus nunc inæqualibus, 3 (angulorum) longioribus extimo longissimo, nunc subæqualibus. *Perianthium* involucro inclusum vel vix exsertum.

§ 1. *Suffrutices* (*Chilenses*).

1. C. virgata, suffruticosa, foliis ad basin caulis approximatis linearibus utrinque sericeo-villosis, pedunculis elongatis subnudis subsimplicibus tomentosis, cymis in capitulo terminali condensatis, involucris sericeis, dentibus inæqualibus bracteisque subulato-aristatis. Tab. XIX. fig. 1.

Andes of Chili. *Cuming* (*n.* 205.) ; *Bridges* (*n.* 519.). (*v. s.*)

Caules basi cæspitosi, foliis numerosis, superioribus 3—4-natìm verticillatis 6—10 lin. longis basi caulem vaginantibus connatis. *Pedunculi* vel *rami* floriferi erecti, pedales, foliorum verticillis 1—2 instructi. *Involucri* dentes exteriores recurvi. *Flos* in involucro brevitèr pedicellatus. *Perianthii* laciniæ subæquales, patentes, crenulatæ.

2. C. peduncularis, suffruticosa, foliis ad basin caulis approximatis oblongo-linearibus utrinque sericeo-villosis, pedunculis elongatis nudis tomentosis, cymis in capitulo terminali solitario condensatis, involucris tomentosis, dentibus 3 minimis, 3 bracteisque lanceolatis muticis.

Andes of Chili. *Cuming* (*n.* 288.). (*v. s.*)

Folia minùs conferta et parùm longiora quàm in *C. virgatâ*, plerumque alterna, basi dilatato-amplexicaulia. *Pedunculi* demùm ferè pedales. *Involucri*

dentes exteriores erecti. *Flos* brevissimè pedicellatus. *Perianthii* laciniæ vix inæquales.

3. C. Macræi, caule suffruticoso ramoso folioso, foliis linearibus ramisque sericeo-pubescentibus, cymis multifloris in capitulo brevitèr pedunculato condensatis, involucris sericeis, dentibus brevissimis inæqualibus bracteisque acutis muticis.

Coquimbo, Chili. *Macrae.* (*v. s.*)

Suffrutex humilis, ramosissimus. *Folia* alterna, basi pilosa. *Pedunculi* 2—3-pollicares, nunc aphylli, nunc folia 3—4 in verticillo disposita gerentes. *Involucra* minora et minùs tomentosa quàm in *C. pedunculari*. *Flos* longè pedicellatus (at non exsertus). *Perianthium* breve. *Laciniæ* interiores exterioribus duplò majores.

4. C. ramosissima, caule suffruticoso ramosissimo folioso, foliis linearibus ramisque sericeo-pubescentibus, pedunculis trichotomis, cymis laxis, involucris sericeis, dentibus brevibus inæqualibus acutis muticis.

Baths of Collina, Chili. *Macrae.* (*v. s.*)

Media inter *C. Macræi* et *C. paniculatam*. Habitus prioris à quâ differt cymis laxè trichotomis ad trichotomias foliatis; à *C. paniculatâ* differt involucris longioribus et inflorescentiâ multò breviore. *Perianthium* subvillosum.

5. C. paniculata, caule suffruticoso ramoso folioso, foliis linearibus utrinque ramisque tomentoso-pubescentibus, paniculâ laxè 2—3-chotomâ divaricatâ, cymis paucifloris, involucris sericeo-tomentosis, dentibus brevibus inæqualibus acutis muticis.

Andes of Chili. *Cuming* (*n.* 249); *Bridges* (*n.* 515.). (*v. s.*)

Caules basi tortuoso-ramosi, foliis alternis basi semiamplexicaulibus. *Paniculæ* numerosæ semipedales, foliis sub ramificationibus verticillatis basi connatis. *Involucra* alia in dichotomiis trichotomiisve sessilia, alia ad apices ramorum in cymis 6—12-floris glomerata. *Dentes* crassi subpatentes. *Perianthium* ferè glabrum, laciniis subæqualibus.

6. C. vaginata, caule suffruticoso ramoso folioso, foliis lanceolatis aristatis

basi dilatato-vaginantibus ramisque sericeo-pilosis, paniculâ dichotomâ, cymis corymbosis, involucris sericeo-pilosis dentibus vix inæqualibus brevitèr subulato-aristatis.

Valparaiso. *Cuming* (*n.* 479.); *Bridges.* (*v. s.*)

Caules basi procumbentes vaginis foliorum omninò obtecti. *Rami* floriferi dichotomi, foliis sæpiùs oppositis basi connatis. *Perianthium* brevitèr pedicellatum, extùs sericeum, laciniis subæqualibus. In specimine Cumingiano (juniore) folia bractea et involucra omnia subulato-aristata, in Bridgesiano (fructifero) aristæ breviores vel nullæ.

7. C. glabrescens, caule suffruticoso humili ramoso folioso, foliis linearibus ramisque parcè pilosis vel demùm glabratis, cymis subcorymbosis, involucris glabris, dentibus subæqualibus subulato-aristatis.

Coquimbo, Chili. *Lord Colchester, Cuming* (*n.* 904.)*. (*v. s.*)

Affinis *C. Macræi*, differt staturâ humiliore, glabritie et dentibus involucri. Perianthii laciniæ ferè æquales.

§ 2. *Herbaceæ* (*Californicæ*).

8. C. staticoides, annua, foliis radicalibus petiolatis spathulatis hirsutis, caulibus subnudis erectis 2—3-chotomè ramosis, cymis laxè corymboso-paniculatis, involucris glabriusculis, dentibus inæqualibus subulato-cristatis.

California. *Douglas.* (*v. s.*)

Habitu ad *Staticem oleæfoliam* vel ferè *S. aristatam* refert. *Folia* radicalia rosulata. *Caules* semipedales, ad dichotomias articulati, bracteas 2—3 breves verticillatas gerentes. *Involucra* fructifera aucta, dentibus valdè inæqualibus. *Perianthium* brevissimè pedicellatum, laciniæ exteriores lanceolatæ, interiores majores obovatæ.

9. C. Douglasii, annua, caule erecto 2—3-chotomè ramoso, foliis radicalibus petiolatis spathulatis, caulinis oblongo-linearibus ramisque subsericeo-pilosis, cymis multifloris in capitulo terminali paniculato condensatis, involucris pilosis, dentibus patentibus basi membranaceo-dilatatis apice inæqualitèr subulato-aristatis.

California. *Douglas.* (*v. s.*)

* A young specimen under the same number appears to be a *Pleurophora*.

Herba semipedalis. *Capitula* florum magnitudine pisi majoris. *Bracteæ* subulatæ dentesque involucri purpurascentia. *Perianthium* subsessile; *laciniæ* omnes æquales, oblongo-cuneatæ, apice truncatæ, mucronulatæ.

10. C. membranacea, annua, caule erecto subdichotome ramoso, foliis linearibus ramisque laxè lanatis, cymis multifloris in capitulis terminalibus subpaniculatis condensatis, involucris tomentosis infundibuliformibus, limbo membranaceo-dilatato, dentibus æqualibus brevitèr subulato-aristatis. Tab. XVII. fig. 11.

California. *Douglas.* (*v. s.*)

Herba subpedalis. *Lana caulis* et *foliorum* nivea, tenuis, subdecidua. *Capitula florum* globosa, fructifera iis scabiosarum nonnullarum similia. *Pedicelli* perianthio æquilongi.

11. C. pungens, subherbacea, ramis elongatis diffusis subdichotomis, foliis petiolatis spathulatis ramisque pilosis, cymis multifloris laxè capitatis, capitulis irregularitèr paniculatis, involucris pubescentibus, dentibus inæqualibus bracteisque longè subulato-aristatis. Tab. XIX. fig. 2.

California. *Douglas.* (*v. s.*)

Herba perennis videtur. *Rami* sesquipedales, pilis mollibus patentibus villosi. *Capitula* secus ramos numerosa, multiflora, brevitèr pedunculata. *Involucri* dentes exteriores uti bracteæ pungentes. *Perianthium* subsessile, laciniis æqualibus.

III. Mucronea.

Involucrum tubulosum, compressum, uniflorum, bidentatum. *Perianthium* involucro inclusum.

1. M. californica. Tab. XX.

California. *Douglas.* (*v. s.*)

Herba annua, spithamæa, pilosiuscula, ramis dichotomis divaricatis. *Folia* inferiora petiolata, oblongo-linearia. *Bracteæ* ad dichotomias, et sub floribus amplexicaules, stellato-trilobæ, lobis lato-ovatis apice aristulatis. *Involucra* inferiora in dichotomiis solitaria et sessilia, superiora ad apices ramorum approximata. *Dentes* involucri subulato-aristati, subpungentes, exteriore longiore. *Perianthium* pedicello suo æquilongum, laciniis subæqualibus.

EXPLANATION OF THE PLATES.

Tab. XVII.

Fig. 1. Arrangement of the floral organs in *Rheum crassinervium.*

2. Ditto in *Rumex alpinus.*

3. Ditto in *Atraphaxis spinosa.*

4. Ditto in *Kœnigia islandica.*

5. Ditto in *Polygonum alpinum.*

6. Ditto in *Polygonum Convolvulus.*

7 & 8. Ditto in *Polygonum Persicaria.*

9. Ditto in *Polygonum virginianum.*

10. *Eriogonum compositum.* *a.* Involucrum. *b.* Flower. *c.* Perianthium laid open. *d.* Pistillum. *e.* Fruit surrounded by the persistent perianthium. *f.* Fruit separate. *g.* Seed. *h.* Transverse section of the seed.

11. *Chorizanthe membranacea.* *a.* Involucrum. *b.* Pericarpium. *c.* Seed. *d.* Longitudinal section of ditto.

Tab. XVIII.

Fig. 1. *Eriogonum angulosum.*

2. *Eriogonum umbellatum.*

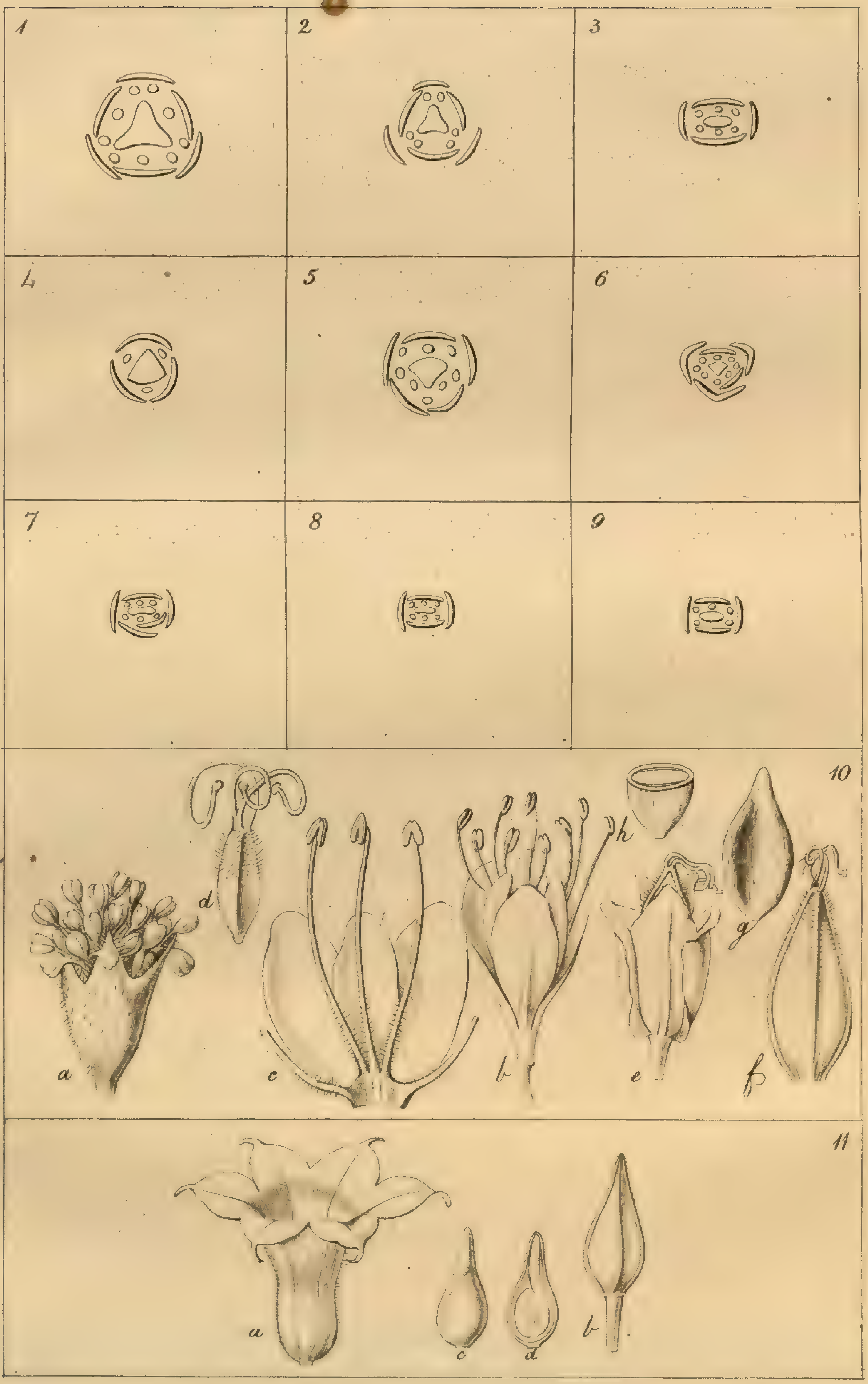
Tab. XIX.

Fig. 1. *Chorizanthe virgata.* *a.* Involucrum. *b.* Perianthium.

2. *Chorizanthe pungens.* *a.* Involucrum. *b.* The same laid open. *c.* Perianthium. *d.* The same laid open, with the stamens. *e.* Pistillum.

Tab. XX.

Fig. 1. *Mucronea californica.* *a.* Involucrum. *b.* Perianthium.



Miss Drake del.

H. Weddell. sc.

Miss Drake del. 2 1 H. Weddell sc.

Miss Drake del.

Miss Drake. del.

H. Weddell. sc.

XXII. *Observations on the Species of* Fedia. *By* JOSEPH WOODS, *Esq., F.L.S.*

Read April 21st, 1835.

MODERN botanists are generally agreed that the several varieties of the *Valeriana Locusta* of Linnæus, with the addition of one or two allied species, form a very natural genus, separated from Valerian by habit as well as by the want of a feathery crown to the seed. For this they have mostly adopted the name of *Fedia,* of uncertain derivation, though supposed by some authors to come from *Hœdus,* or *Fœdus,* a kid. It was first introduced by Adanson, but, according to De Candolle, not applied by him to this genus. De Candolle himself again separates from this group two plants, which differ from the rest in having a ringent flower with a long tube, and only two stamens. To these he confines the name of *Fedia,* and calls the others *Valerianella.* I am not disposed to follow him in the separation of these genera, and still less so in his nomenclature. Even if out of respect for Tournefort, whose name Linnæus appears to have altered merely to please his ear, we prefer *Brunella* to *Prunella*; and if we restore *Lampsana,* a name adopted by Vaillant from Dioscorides, to the place of *Lapsana,* there is still no sufficient reason for adopting such a name as *Valerianella.* The rules given by Linnæus for the formation of generic names are perhaps in some instances arbitrary and fanciful; but those which direct us to avoid diminutives and names compounded of those of other genera are so evidently just and reasonable, that one is apt to suspect that those who refuse them are under the influence of some prejudice, or are guided by national partiality. The French botanists complain that Linnæus was sometimes misled by an unworthy jealousy of the talents and reputation of Tournefort. Do they not themselves show a wish to depreciate Linnæus, and to keep him out of sight as much as possible?

We are indebted, I believe, to De Candolle for pointing out some excellent subdivisions in this genus, taken from the structure of the fruit. He distinguishes:

1. Locustæ, with one or two empty cells, and a gibbous, corky, or spongy mass at the back of the fertile one.

2. Psilocœlæ. The two empty cells each reduced to a hollow nerve. The description of the genus assumes the existence of empty cells; otherwise, perhaps, it would be better to say that the fruit in this section had only one cell. The nerve is not always sensibly hollow; and a similar nerve sometimes exists, in *F. Auricula*, for instance, on the surface of each empty cell.

3. Platycœlæ. Two empty cells, as large, or nearly as large, as the fertile ones. Section of the fruit rounded.

4. Selenocœlæ. Section of the fruit crescent-shaped, with two empty cells.

These divisions once pointed out cannot be neglected by succeeding botanists; but we may be permitted to introduce some modifications in the divisions themselves, and in their arrangement, and some alterations in the species assigned to each.

Fedia Cornucopiæ (*Fedia* of De Candolle). This plant seems not to be frequent, though widely scattered, on the coasts of the Mediterranean. I have not seen the fruit in a perfect state. A second species, *F. scorpioides*, with which I am unacquainted, has stalked leaves and unilateral spikes of flowers. It is a native of Tangier.

Division 1. Locustæ.

De Candolle separates this into two sections, the first having only one, and the latter two barren cells. This character is hardly sufficient, since in *V. olitoria* (fig. 1.), which is at the head of the first division, we not unfrequently find the trace of a dissepiment separating, more or less completely, the empty cell into two parts. Reichenbach says that the fruit of this species is sometimes hairy. I have never met with it so. But this is a character which seems very variable in the genus.

Two other species are enumerated. *Valerianella radiata*, which the author suspects to be an American variety of *V. olitoria*, but which, from specimens shown me by Mr. Bentham, seems rather to be a name for several European species when they have been carried over to America; and *V. exscapa*, a plant of Caucasus, described as having two fertile cells.

The second subdivision of the Locustæ, where the separation of the cells is uniformly complete, contains three names: *V. turgida*, *V. gibbosa*, and *V. co-*

stata. A comparison of the specimens from the Chev. de Steven, in the herbarium of Sir J. E. Smith, with the description in the Moscow Transactions, has convinced me that the first of these belongs to the *Selenocœlæ,* and is a species which I have gathered at Rome. The second, found by Gasparini on the mountains of the Madonia, and published by Gussone in the *Floræ Siculæ Prodromus,* is supposed by De Candolle to be nearly allied to *V. turgida.* The figure of the fruit, however, which he has given in the *Mémoire sur la Famille des Valérianées,* is hardly distinguishable from that of *V. olitoria,* from which this plant seems chiefly to differ by its quite entire bracteæ. The third is from the South of Tauria. It is described as smaller than the two preceding, and as having a deep furrow on each barren cell. I have seen no specimen of either of the two last.

Div. 2. Psilocœlæ.

In following the order of the *Prodromus,* we now come to the *Psilocœlæ,* although some of the *Selenocœlæ* appear to be more closely allied to the *Locustæ* both in habit and in artificial character. De Candolle has two subdivisions of *Psilocœlæ.* The first, with recurved teeth, contains *V. uncinata* (fig. 2.) and *V. echinata.* The former is a plant from Caucasus, which has two distinct barren cells at the base of the fruit, but much smaller than the fertile one. A section of the upper part of the seed-vessel exhibits, besides the fertile cell which extends into the crown, three other openings filled with a white pith-like substance. That near the base shows also a pith-filled opening on the side of each barren cell. In *V. echinata,* the second cell is nearly as large as the fertile one, and it is uniformly this cell, and not that containing the seed, which is prolonged into the largest horn;—the three horns which terminate the fruit being in this species a prolongation of the cells, and not a distinct calyx. This description seems inconsistent with the admission of this plant among the *Psilocœlæ,* where it is nevertheless placed by Soyer Willemet as well as by De Candolle. Of the five species forming the subdivision marked by an erect calyx, *V. Morisonii* var. β. *leiocarpa,* is according to De Candolle the *Fedia dentata* of *Engl. Bot. t.* 1370.; but he also cites Reichenbach, *Pl. Cr. t.* 62. (fig. 3.), and the same work, *t.* 63., for the *V. Morisonii* α. with hairy fruit. Both these figures appear to me to represent varieties of *F. eriocarpa,* while that of *Engl. Bot.* is either *F. dentata,* or its variety *F. mixta.* The latter

differs from the usual appearance of *F. dentata* in having a rounder fruit, a less elongated crown, and the teeth at the base of the crown larger in proportion. I have never seen it hairless, but it probably varies in this respect, and *F. dentata* is sometimes hairy. Fig. 4. is *F. dentata* from Llangollen. Fig. 5. a hairy variety from Sussex. Fig. 6. *F. mixta* from Dr. Hooker. This seems also to be the plant of De Candolle. Fig. 7. is perhaps also *F. mixta.* The specimens came from Llandydno. *Valerianella puberula* is borrowed from Gussone, in whose description the *fructu non umbilicato* is put in strong opposition to the *fructu umbilicato* in the character of *F. eriocarpa.* I should not have placed the two plants in the same section, but since De Candolle has added to the former his accustomed "(v. s.)," *vidi siccam,* I cannot refuse to admit it among the one-celled *Fediæ.* De Candolle quotes to *V. puberula* the *F. microcarpa* of Reichenbach, *Pl. Cr. t.* 114. (fig. 8.), a figure to which Gussone refers for his *F. microcarpa* and not for his *F. puberula.* Fig. 9. is *F. microcarpa* from Italy; fig. 10. the same from Gussone. *F. truncata,* a native of Crete, (fig. 10*. copied from Reichenbach,) seems to differ from *F. microcarpa* in little but the much greater expansion of the blunt, entire, oblique crown. The seeds of the *F. microcarpa* of Gussone in specimens communicated to Mr. Bentham from the author, have, on the contrary, a smaller crown than that figured by Reichenbach, and the whole seed is smaller, and covered with hairs instead of the short points which make the fruit of Reichenbach's plant rather rough than hairy. The *F. sphærocarpa* of Gussone I should have suspected to be also the *F. microcarpa* of Reichenbach, if he had not himself decided differently. There remains to be noticed *F. eriocarpa,* a plant which varies so much in the expansion of the crown as to make it difficult to draw the line between it and *F. mixta.* Fig. 11. is copied from De Candolle's *Mémoire sur les Valérianées.* Fig. 12. was gathered at Perigueux. Fig. 13. in Italy. Fig. 14., which is quite smooth, at Saintes. Fig. 13. is the most common appearance. The rigid habit, the fruitstalks thickened upwards, and the sessile flowers of this species, give to it something of the appearance of *F. echinata.* *F. eriocarpa,* according to De Candolle, has 6 teeth in the crown; *F. mixta* only 3. This leads me to some remarks on the teeth of these plants. In *F. coronata* and its allied species there is a tooth in the centre of the anterior face of the fruit, *i. e.* above the junction of the two abortive cells; and there is

also a tooth opposite to this, and, consequently, the number of teeth in the imaginary regular type must always be even. When the contrary is the case, it is because an additional intermediate tooth is developed on one side more than on the other, producing some degree of irregularity; or, perhaps, we should rather say that one of the lateral segments—for it is there principally that the irregularity takes place—is more subdivided than its opposite one. In the *Psilocœlæ* the case is exactly the reverse. The middle tooth of the anterior face is wanting, and the number of teeth in the type must be considered as uneven. But the lateral teeth in this division are usually small, and often unequally developed, so that there is one tooth, or perhaps even two, more on one side than on the other. Thus an even number of teeth may occasionally occur, but it ought hardly to enter into the specific character. Reichenbach's figures often attribute to the *Psilocœlæ* a tooth in the centre of the anterior face. I can only say that I have never met with such a circumstance.

Div. 3. Platycœlæ.

We now pass to the *Platycœlæ.* In several species of this division the barren cells are contiguous at top and bottom, so that a section of the fruit would there be nearly round, but they are separate in the middle. In *F. Auricula* (fig. 15.) they are contiguous for their whole length; and in *F. echinata* (fig. 16.) they may be said to touch in their whole length, but without having a common partition. The two cells are not in any part united in any of them. *F. uncinata* and *F. echinata,* both of which I incline to place in this division, have been already mentioned. The former was brought by the Chev. de Steven from Caucasus, but has not, I believe, hitherto been found in Europe; the latter is frequent in the neighbourhood of the Mediterranean. In *F. Auricula* the inner sides of the barren cells sometimes shrink away in drying, and give to the fruit somewhat of the appearance of that of the *Selenocœlæ,* and well characterized by the expression "*fructu anticè rimoso,*" used by De Candolle to some of that tribe. *F. tridentata* (fig. 17.) of Reichenbach is a variety of *F. Auricula.* The terminating tooth in this species is often very small, thin, membranous and fragile. Gaudin describes it 3—6-*dentata.* I have never observed more than 3 teeth. De Candolle's expression, "*calycis limbo acutè auriculiformi*" would suit some of my specimens, but the tooth is not always

acute. This is a common plant throughout the greater part of France, and it is probably the var. *tridentata*, which is described as *V. dentata* by De Candolle. I have seen a Cornish specimen in the herbarium of Mr. Borrer; and if the dissections added by Dr. Hooker to the figure of *F. olitoria* in the *Flora Londinensis* belong to this plant, we must suppose it not very rare in England.

F. pumila (fig. 18.) has the barren cells separate in the middle and contiguous at the extremities. The appearance thus obtained I suppose to be what is meant by the term *anticè exarato* of De Candolle, while the *anticè umbilicato* of Gussone I rather refer to the small flat surface surrounded by a prominent rib, which forms the external peculiarity of the *Psilocœlæ*. Unfortunately, they neither of them use the other term in their original descriptions, and the term "umbilicate" might be applied to either appearance. The capsule of *F. pumila* ends in three short points, concavely truncate, which appear rather to be an extension of the cells than the teeth of a calyx.

F. sphærocarpa. De Candolle, not having seen specimens, adopts the description of Gussone, perhaps with some reference to the figure in *Guss. Pl. Rar. t.* 4., which I have not seen. He expresses a doubt if it be different from *V. pumila*, but the description, "*facie umbilicato*," would incline me to place it among the *Psilocœlæ*. There is one other plant belonging to that division of the *Platycœlæ* in which the teeth of the crown are not hooked. This is *V. trigonocarpa*, a native of the neighbourhood of Constantinople. The name expresses its most distinguishing character. I have seen neither specimens nor figure.

The species of this division, which have hooked teeth, noticed in De Candolle's *Prodromus* are two,—*F. hamata* and *F. coronata*. If, however, the *V. platyloba* (*F. rotata* of Reichenbach) do not also belong to it, I am afraid we can hardly consider the *Selenocœlæ* as forming a very natural division. The difference between *V. hamata* and *coronata* is not very well marked by the description in the *Prodromus*, resting almost entirely on the villous mat which covers the bottom of the calyx in the latter species, while the former is in that part entirely devoid of hairs. This is a useful distinction; but from my own specimens, gathered in the South of France early in the summer of 1831, I should describe *F. hamata* (fig. 19.) as having a broad margin ending in 6 subulate teeth; each tooth terminating in a hooked awn, with rounded inter-

mediate sinuses. *F. coronata* (fig. 20.), on the contrary, has the teeth so deeply divided that they might almost be said to form a calyx of six leaves, leaving little or no continuous margin, and the sinuses are acute. The form of the whole fruit is strictly campanulate. *F. discoidea* of Reichenbach I take to be *F. hamata* with divided teeth. His *F. coronata* is the plant of De Candolle. To this we must also refer the *F. sicula* of Gussone, while the *F. coronata* of this author is the *V. hamata* of De Candolle.

I believe I may add to this division a plant which I gathered at Athens in 1816, with slender ciliate divisions to the crown, separate down to the base, and which may be called *F. ciliata* (fig. 22.); but the only clear specimen which I have is not far enough advanced to exhibit fully the character of the fruit.

F. vesicaria (fig. 23.) is correctly described by the Chev. Steven as having a fruit with five cells. It may therefore occupy a division by itself; a distinction to which it seems entitled by the peculiarity of its inflated calyx.

Div. 4. Selenocœlæ.

We now arrive at the last division of De Candolle, in which he places two species,—*V. platyloba*, a name of Dufresne, synonymous with the *F. rotata* of Reichenbach, as corrected in page 93 of *Pl. Cr.*, and *V. carinata*, the fruit of which is not at all keeled. The appearance of the fruit in these species has nothing in common, except the peculiarity which forms the artificial character; and this, as figured by De Candolle in his *Mémoire sur la Famille des Valérianées*, and by Reichenbach in his *Plantæ Criticæ*, does not seem very clear, depending rather on the convex or concave line assumed by the internal face of each empty cell than on any more durable or important difference. This line might be supposed to take a different curve without any change of structure; and I have already noticed that it is sometimes observable in the dried seeds of *F. Auricula*, a plant certainly not belonging to this division. In the plates of De Candolle (fig. 25.) and of Reichenbach (fig. 24.) the dissepiment between these barren cells is represented as very narrow. In some specimens of *F. carinata*, gathered by Mr. E. Forster near Ongar in Essex (fig. 27.), the dissepiment is much broader, the cells lying side by side. Of the specimens of Steven (fig. 26.) I did not presume to make a section. In the *F. turgida*, a plant clearly belonging to this division by the crescent-shaped

section of its fruit, the cells are detached and have no common dissepiment. A contraction between the barren cells and the fertile one forming a slight furrow on each side of the fruit is marked in both species, and I find it to exist in *F. carinata*; but according to the figure of De Candolle, such a depression must also sometimes exist in *F. hamata,* and it does not exist in *F. turgida.* On the whole, it appears that this section requires a re-examination, but I have not at present sufficient materials to define it more accurately. My attention at Rome was not drawn to *F. turgida* (fig. 28.) until the plant was so far advanced as to offer me no flowers and hardly any seed. Its general appearance so closely resembles that of *F. olitoria* that it does not press on our attention. Gussone describes *F. carinata* as "*ecoronato,*" which made me at one time imagine that his plant might be the *F. turgida,* but his account agrees in other respects too precisely with the *F. carinata* to allow this suspicion to remain. The *F. brachycarpa* of Bertoloni is, perhaps, the *V. platyloba* of Dufresne and De Candolle. The latter botanist says that his plant is found "in regione Mediterraneâ," but with a mark of doubt. Reichenbach only says of his *F. rotata,* that it came from the botanic garden at Göttingen.

Hitherto I have confined myself to characters derived from the fruit, which seems in this genus to furnish the best specific distinctions. We must not, however, altogether reject other particulars. Gussone, who has ten species in the *Prodromus Floræ Siculæ,* and seems carefully to have studied the subject, divides the *Fediæ* into those whose bracteæ are appressed when the plant is in fruit, and those where they are spreading; and the character first mentioned in the specific phrase is that of a stem rough at the angles, or altogether smooth.

In the first division are:

F. cornucopiæ . . . Flowers ringent.
sicula . . . . Calyx equal, erect, cyathiform.
coronata . . . . . Calyx equal, spreading, campanulate.
eriocarpa . . . . . Angles rough. Calyx oblique, six-toothed.
microcarpa. . . . Angles smooth. Calyx oblique, entire.

In the second:

F. puberula . . . . . Angles rough. Calyx with 3 teeth, one of which is larger and longer than the rest.

F. sphærocarpa. . . Angles smooth. Calyx with 3 unequal teeth. Stem-leaves pinnatifid at the base.

olitoria . . . . . . Angles rough. Calyx-teeth hardly distinguishable.

gibbosa . . . . . . Stem nearly smooth. Margins of the bracteæ entire.

carinata . . . . . Angles smooth. Calyx 0. All the leaves entire.

Neither the uprightness of the bracteæ, nor the roughness of the angles of the stem, appear to be very distinctly marked characters in this genus. They may, however, be noticed as well as the capitate flowers. With respect to the latter character, it is to be observed that the type of the inflorescence in the genus *Fedia*, except, perhaps, in *F. scorpioides*, is that of a dichotomous panicle with the flowers seated in its forks. This arrangement is most distinguishable in the *Psilocœlæ*, the flowers being there sufficiently separate from each other. In the *Locustæ* it may still be traced, but the upper branches are much shortened, so as to reduce the panicle to a loose head; some solitary flowers are, however, usually discernible. In *F. pumila* the degree of condensation is about the same, but there are no solitary flowers. In all the species where the border is much expanded and nearly equal, as in *F. hamata*, *coronata*, &c., the flowers form dense globular heads, in which, without the help of analogy, we should scarcely be able to trace the typical arrangement; and in *F. echinata* the upper branches of the panicle seem to unite and to form a wedgelike receptacle, on which the flowers are seated.

The character of the leaves seems to have some analogy with that of the inflorescence. The lower leaves in all the species seem to be generally if not always quite entire. The upper ones, though often entire, have a tendency to division in the lower part. These are *dentate* or *inciso-dentate* in the *Locustæ* and *Psilocœlæ*; pinnatifid in the *Platycœlæ* and in *F. vesicaria*. The distinction does not depend merely on the depth of the division. The teeth of the first-mentioned sections narrow gradually from the base, and are usually acute. Those of the latter preserve for some distance their original width, or increase it, and are I believe always obtuse. The uppermost leaves are again undivided, being gradually converted into bracteæ. These bracteæ in all the species, except *F. gibbosa*, are ciliato-dentate; and there is, perhaps, always a scariose margin, very narrow in the *Locustæ*, but occupying nearly the whole bracteæ in most of the *Platycœlæ*.

Perhaps the European species might be thus arranged:

A. Flowers ringent.

1. *F. cornucopiæ.* Upper leaves sessile. Flowers in dichotomous heads; fruit-stalks thickening upwards.

Coasts of Mediterranean.

B. Flowers nearly regular.

a. Fruit with a corky mass at the back of the seed.

2. *F. olitoria.* Fruit compressed, oblique. Barren cells without a furrow, the dissepiment imperfect. Bracteæ leafy, dentato-ciliate. Upper leaves sometimes toothed at the base.

3. *F. gibbosa.* Fruit gibbous (plano-convex). Barren cells each with a furrow at the back. Dissepiment complete. Bracteæ quite entire.

Sicily.

b. Section of the fruit crescent-shaped. Two barren cells.

4. *F. turgida.* Fruit cup-shaped, or in external appearance sphærical with a sector cut out. Crown 0. Flowers in heads.

Rome.

5. *F. carinata.* Fruit oblong, boat-shaped, with a simple blunt crown. Flowers in heads. Upper leaves sometimes toothed at the base.

6. *F. platyloba.* Lobes of the crown with a hooked awn. Calyx somewhat hirsute within. Flowers in heads. Upper leaves sometimes toothed at the base.

Coasts of Mediterranean?

c. Barren cells 2, hardly touching in the middle. Divisions of the calyx hooked. Flowers in globular heads. Upper leaves generally pinnatifid at the base.

7. *F. hamata.* Crown a campanulate spreading border, hairless within, ending in 6—12 lobes with obtuse sinuses, and each terminating in a hooked awn.

South of Europe.

8. *F. coronata.* Crown nearly erect, villous within, divided down to the base into 6—12 triangular segments.

South of Europe.

9. *F. ciliata.* Crown of 6 setiform ciliate divisions.

Athens.

d. Barren cells 2, hardly touching in the middle, prolonged into teeth or horns, but not forming a membranous calyx.

10. *F. echinata.* Cells quite separate, each terminating in a recurved horn. Flowers in sessile heads on the thickened stalks.

Common on coasts of the Mediterranean.

11. *F. trigonocarpa.* "Fruit triangular, hardly crowned. Angles callous. Flowèrs in heads. Leaves quite entire, the upper ones oblong-ciliate at the base.

"Constantinople."

12. *F. sphœrocarpa.* "Fruit globose, with 3 very short teeth, of which one is longer, one face umbilicate, the other two-ribbed. Bracteæ lanceolate." I follow De Candolle in keeping this separate, although, if it truly belong to this division, I see nothing by which to distinguish it from *F. pumila.*

Sicily.

13. *F. pumila.* Fruit terminating in three very short teeth. Flowers in loose heads. Bracteæ scariose, ovate.

South of France.

e. Barren cells 2 contiguous. Crown erect.

14. *F. Auricula.* Crown of one membranous leaf. Flowers distant. Upper leaves inciso-dentate at the base.

France, &c.

α. Crown simple.

β. Tridentate. Crown toothed.

f. Barren cells 4.

15. *F. vesicaria.* Calyx inflated, with minute inflexed teeth. Flowers in globular heads. Bracteæ orbicular. Upper leaves pinnatifid at the base.

South-east of Europe.

g. Barren cells wanting, or reduced to a mere nerve. Panicle nearly fastigiate, the lower flowers solitary.

16. *F. lasiocephala.* "Crown with 6 subulate, hooked, smooth teeth, longer than the hirsute border." Reichenbach quotes Betcke for this plant, and says of it "that the barren cells are so far obliterated that the section is like that of *F. eriocarpa.*" In other respects it appears closely to resemble *F. hamata.*

17. *F. eriocarpa.* Crown an oblique border with 5—7 straight teeth. Fruit ovoid. Bracteæ erect lanceolate, somewhat scariose. Leaves entire.

18. *F. dentata.* Crown of one leaf, erect, acute, generally toothed at the base. Fruit ovoid. Bracteæ nearly erect. Upper leaves toothed at the base.

β. *mixta.* Fruit rounder. Crown shorter.

19. *F. puberula.* "Crown oblong, very short, 3—5-toothed. Fruit ovoid, downy. Flowers corymbose. Bracteæ linear erect. Upper leaves very rarely with a tooth at the base."

Sicily.

20. *F. microcarpa.* Crown oblique, entire, obtuse. Fruit nearly sphærical, rough. Bracteæ erect, somewhat scariose. Leaves entire.

South of Europe.

21. *F. truncata.* "Crown earlike, oblique, entire, as long as the ovoid downy fruit. Bracteæ linear, dilated at the base. Flowers in cymes. Leaves oblong, quite entire."

Crete.

DESCRIPTION OF TAB. XXI.

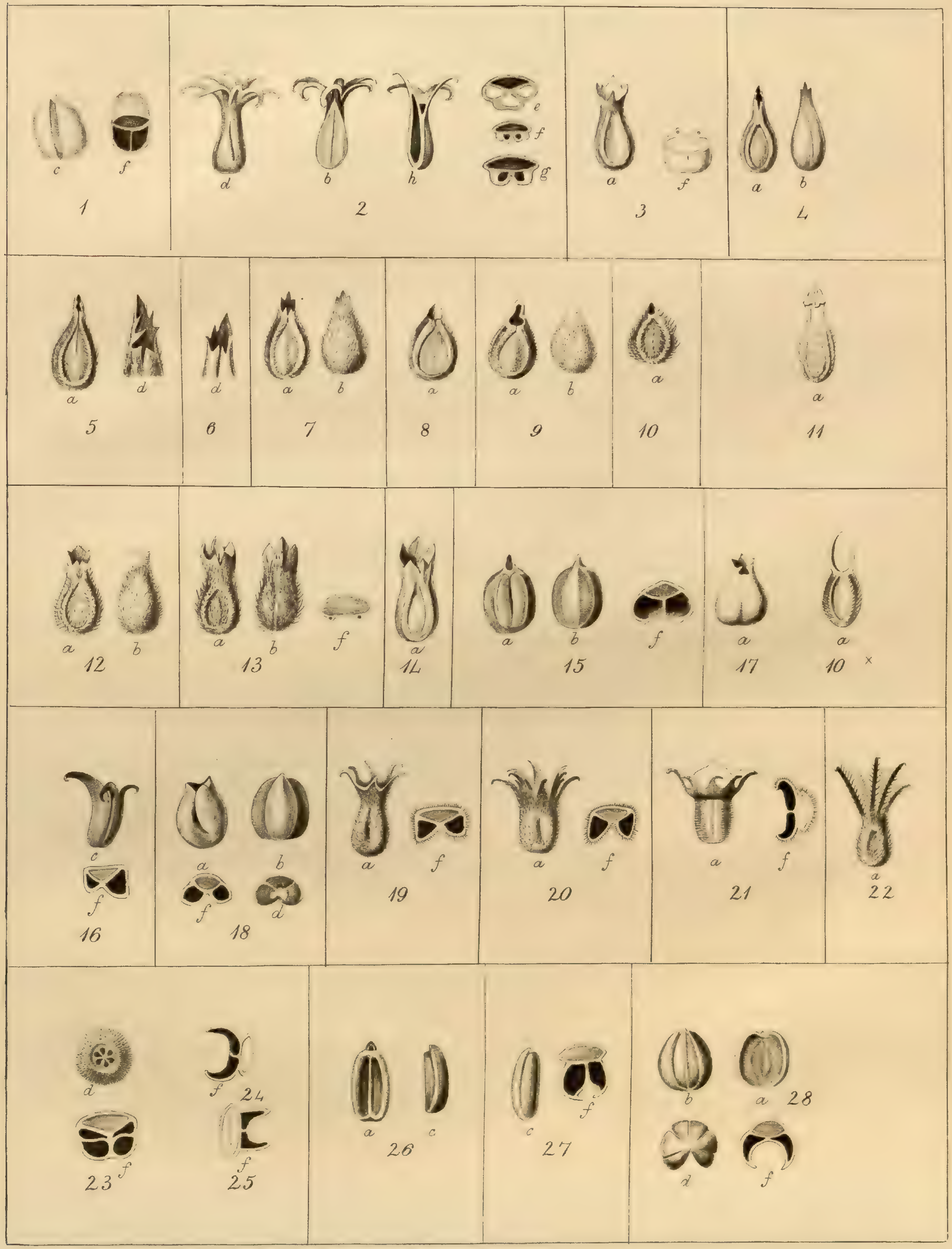
In all the figures,

a. indicates the face of the fruit, *i. e.* on the side of the barren cells.
b. ——— the back of the fruit.
c. ——— the side of the fruit.
d. ——— the summit more highly magnified.
d. ——— the summit seen vertically.
e. ——— section near the summit.
f. ——— *id.* in the middle.
g. ——— *id.* near the base.
h. ——— the vertical section.

Fig. 1. *Fedia olitoria.*

2. *F. uncinata.* Seeds given me by Mr. Bentham from the botanic garden at Avignon.

3. *F. dentata* of Reichenbach, copied from *Pl. Cr. t.* 62. This is cited



J.Woods del.

H.Weddell sc.

by De Candolle under *V. Morisonii,* to which species he refers the *F. dentata* of English Botany. It seems to me to belong to *F. eriocarpa*.

4. *F. dentata,* from Llangollen.
5. *F. dentata,* hairy; found by Mr. Borrer in Sussex.
6. Crown of *F. mixta*: specimen from Dr. Hooker.
7. *F. mixta,* or possibly *F. eriocarpa,* from Llandydno on the Great Ormes Head.
8. *F. microcarpa,* copied from Reichenbach, *Pl. Cr. t.* 114.
9. *F. microcarpa,* from Italy.
10. *F. microcarpa*: specimen from Gussone.

10*. *F. truncata*: copied from Reichenbach, *Pl. Cr. t.* 115.

11. *F. eriocarpa*: copied from De Candolle, *Mémoire sur les Valérianées.*
12. *F. eriocarpa,* from Perigueux.
13. *F. eriocarpa,* from Italy.
14. *F. eriocarpa,* hairless, from Saintes.
15. *F. Auricula,* from Paris.
16. *F. echinata,* from Nice.
17. *F. tridentata*: copied from Reichenbach, *Pl. Cr. t.* 64., a variety of *F. Auricula.*
18. *F. pumila,* from the South of France.
19. *F. hamata,* ditto.
20. *F. coronata,* ditto.
21. *F. platyloba* (*F. rotata* of Reichenbach): copied from *Pl. Cr. t.* 67.
22. *F. ciliata,* from Athens.
23. *F. vesicaria*: specimens gathered by Mr. Bentham in the botanic garden at Montpellier.
24. Section of *F. carinata*; copied from Reichenbach, *Pl. Cr. t.* 61.
25. ———————————— De Candolle, *Mém. sur les Val.*
26. *F. carinata,* from Steven, in the herbarium of Sir J. E. Smith.
27. *F. carinata,* gathered by Mr. E. Forster at Ongar in Essex.
28. *F. turgida,* from Rome.

XXIII. *Remarks on some British* Ferns. *By Mr.* David Don, *Libr. L.S.*

Read March 18th, 1834.

My attention having been lately directed to the examination of some species of Ferns more recently added to the British Flora, with a view to determine how far they merited the rank which has been assigned to them, I beg leave to lay the results of my investigation before the Linnean Society, being persuaded that any attempts to clear up the synonymy of our native plants will meet with its approbation and encouragement. I shall commence with the

Aspidium dumetorum,

a species first proposed by our late President in the 4th volume of the English Flora. This is made up of two plants, the one from Cromford Moor being a dwarf state of *A. dilatatum*, and the other from Ravelston Wood, near Edinburgh, having the segments of the frond abruptly truncate, and the habit, at first sight, altogether peculiar; but an inspection of the original specimens in the Smithian herbarium proves it to be nothing more than an accidental variety of the same species, namely, *Aspidium dilatatum*, arising from disease, which is shown by the sudden termination of the costæ, and by the partial decay of the other segments. Specimens of the more ordinary state of *A. dilatatum* gathered at the same time and from the same locality are similarly affected, but in a less degree. The distinctions derived from the fructification in the English Flora are altogether fallacious, and are partly dependent on the age of the frond, and partly on that of the individual plant. It is clear, therefore, that the *Aspidium dumetorum* must be erased from the list of species.

The next species I shall have to notice is the

Nephrodium rigidum.

I formerly expressed a suspicion of the correctness of the plant published

in the Supplement to English Botany under the name of *rigidum,* but having been lately favoured by the Rev. W. T. Bree with cultivated specimens of the plant gathered by him on Ingleborough, I am now satisfied that my suspicions were unfounded, and that it is really the same with the plant of Swartz, which is accurately figured by Schkuhr in his *Kryptogamische Gewächse, tab.* 38. There is a Swiss specimen from Davall, and another collected in Dauphiny in the Smithian herbarium, which only differ from Mr. Bree's cultivated specimens in their smaller size. The species, which is truly distinct, evidently ranks next to *dilatatum* and *spinulosum,* but differs from both in its larger and more crowded sori, and in its broader and more depressed indusium. The fronds are lanceolate, and both the stipes and rhachis are copiously clothed with long narrow ramentaceous scales, as in *Aspidium aculeatum.* In *dilatatum* and *spinulosum* the rhachis is nearly naked, and the stipes is furnished with fewer and broader scales.

The more delicate fronds, having the pinnulæ pinnatifid, with the lobes serrated with pointed incurved teeth, and the more scaly rhachis essentially distinguish it from *Nephrodium Filix mas,* between which and *spinulosum* it appears to be intermediate in its habit and characters.

I beg to propose the following character for the species:

N. rigidum, fronde lanceolatâ bipinnatâ: pinnulis oblongis pinnatifidis: laciniis argutè dentato-serratis: venulis inconspicuis, soris biseriatìm contiguis, indusio scarioso dilatato, stipite rhachique densè paleaceis.

Aspidium rigidum. *Swartz, Syn. p.* 53. *Schkuhr, Krypt. Gew. p.* 40. *t.* 38. *Willd. Sp. Pl.* v. *p.* 265. *Spreng. Syst.* iv. *p.* 106. *Hook. in Engl. Bot. Suppl. t.* 2724.

Polypodium rigidum. *Hoffm. Germ.* ii. *p.* 6.

P. Villarsii. *Bellard. App. ad Fl. Pedem. p.* 49.

P. fragrans. *Vill. Delph.* iii. *p.* 843. (excl. synon.)

Polystichum strigosum. *Roth, Germ.* iii. *p.* 86.

Habitat in Angliæ borealis comitatûs Eboracensis montosis. *Gul. T. Bree.* ♃. (*v. s. c.*)

3. Asplenium Filix fœmina.

There are two very marked varieties of this plant; the one with broader

segments of a dark green, and with the stipes and rhachis of a pale purple hue; the other, and that the commonest, with the segments of a more delicate texture, and the whole frond of a pale green. The latter variety varies much in size according to soil and situation; in damp shady places it becomes the *Filix fœmina* of English Botany, and in more open exposed situations, the *irriguum*; but neither of these states is entitled to be regarded as a distinct form. A specimen of the larger variety in the Linnæan herbarium is marked *Polypodium rhæticum,* and with the usual mark of authenticity attached to the specimen.

4. Cystea dentata.

This is the *Polypodium dentatum* of Dickson, who first distinguished it from *fragilis.* It was discovered by that acute and zealous botanist on Ben Lawers, and afterwards by my late father on the Clova mountains. The plant appears to be peculiar to the Scottish alps, for after an attentive comparison of specimens from various stations, both in the Smithian herbarium and in that of my worthy friend Mr. Forster, I am satisfied that the Welsh plant is not different from *fragilis.* The Scottish plant is distinguished by its broader, rounded pinnæ, with short, blunt teeth, rather crenate than serrated, with the costæ more conspicuous and flexuose. The indusium is much less divided at the margin, which character, if constant, will materially assist in distinguishing it from all the varieties of *fragilis,* among which, I fear, must be reckoned the *angustata,* as I can find no essential mark whereby to separate it. The figure in English Botany is altogether an indifferent one, with the stem and rhachis much too stout for any British species of this genus, and most probably belongs to *fragilis,* for it clearly does not represent the plant now under consideration. It is probable that the *Aspidium tenue* of Schkuhr (tab. 53. *b. p.*), and the "Filix non ramosa, alpina, foliolis, quæ ad alas rotundioribus, omnibus autem dentatis" of Seguier (*Veron.* 3. *p.* 53. *t.* 1. *f.* 2.) belong to *dentata.*

5. Cystea regia.

Dr. Hooker in his British Flora regards this and the *alpina* as identically the same; but I cannot agree to this opinion of my learned friend, for the two plants appear to me to be essentially different. It is distinguished from *alpina* by its more compact frond, by its shorter, broader, and cuneiform segments,

and by the still more important characters of its more copious sori, and of its narrower and tapering indusium. In the *alpina* the segments are linear, and the sori much fewer, being mostly solitary on the lobes, and the indusium broader, truncate, and not taper-pointed.

It is hoped that some fortunate botanist will discover a British station for this plant; for the original one at Low Layton no longer exists, and the Welsh specimens belong to *fragilis.*

The *alpina* is accurately represented by Schkuhr, Jacquin, Seguier, and several other authors; but of the present species there are no authentic figures, except the one in English Botany, and that of Vaillant (*Bot. Paris. t.* 9. *f.* 1.).

XXIV. *Descriptions of Five new Species of the Genus Pinus, discovered by Dr.* Coulter *in California. By Mr.* David Don, *Libr. L.S.*

Read June 2nd, 1835.

THE accession of new species which this highly important genus has received of late years, by the labours of Mr. Douglas, Dr. Wallich, and others, affords a striking example of the superior intelligence and zeal with which scientific researches in distant countries are prosecuted in our times. Mr. Douglas's travels in the North-west regions of the American continent has made us acquainted with seven new species of this genus, some of which are remarkable for their vast size. So large an addition to these giants of the forest from one quarter was scarcely to have been looked for, but the soil and climate of those regions, especially the western flanks of the northern Andes, and the extensive parallel ranges of mountains which extend from south to north through California, appear to be peculiarly favourable to the development and growth of the Fir tribe: for notwithstanding the successful labours of my lamented friend Mr. Douglas, already mentioned, I have to record in this paper five more species collected in the same countries by my learned and indefatigable friend Dr. Coulter, whom a zeal for the advancement of science has led him to devote ten years to the investigation of the natural history of Mexico and California. In the latter country he spent nearly three years, and having visited regions unexplored by Mr. Douglas, many new species have been added to those already made known by that enterprising botanist, and among them the five species of *Pinus* already noticed.

As but a very small proportion of the mountainous parts of that interesting country has been explored, it may be reasonably inferred that many new species of hardy trees, and especially of the Fir tribe, still remain to recompense the labours of some future botanist.

I shall now proceed to lay before the Society the descriptions of the five

new species of *Pinus*; and I have to regret that the specimens of three of them are without leaves, Dr. Coulter not having been able to find them, from the want of a convenient opportunity to arrange his vast collections. The cones of these, however, are so marked as to leave no doubt of their constituting three very distinct species.

1. Pinus Coulteri.

P. foliis ternis prælongis compressis: vaginis filamentoso-laceris, strobilis oblongis solitariis maximis: squamis cuneatis: apicibus elongatis incrassatis lanceolatis mucronatis ancipiti-compressis aduncis.

Habitat in Californiâ, in montibus Sanctæ Luciæ, alt. 3000—4000 ped. *Coulter.* ♄. (v. s. sp.)

Arbor magna, robusta, altitudine 80- v. 100-pedalis, cortice spadiceo obducta, ramis amplis, apice diffusis. *Ramuli* è squamarum stipularium basibus callosis toruloso-tuberculati, crassitie pollicares. *Folia* terna, rarò quaterna v. quina, dodrantalia, incurvata, compressiuscula, mucronata, suprà bisulca, subtùs planiuscula, margine lineâque mediâ elevatâ tenuissimè serrulatis. *Vaginæ* sesquiunciales, crassitie pennæ corvinæ, basi tumidæ: *squamis* ovato-lanceolatis, acuminatis, cartilagineis, spadiceis, nitidis, adpressis, margine scariosis, albis, filamentoso-laceris; *inferioribus* brevissimis, carinatis; *stipularibus* majoribus, longiùs acuminatis, basi cucullatâ callosâ induratâ persistenti. *Strobili* omnium maximi, conico-oblongi, pedales et ultrà, diametro ad medium semipedem adæquant, et libras quatuor circiter pondere: *squamis* cuneatis, apicibus elongatis, lanceolatis, mucronatis, ancipiti-compressis, obsoletè quadrangulis, incurvato-aduncis, crassissimis, induratis, lævibus, nitidis, spadiceis, margine acutis, 1—3-uncialibus; *inferioribus* longioribus, deflexo-patentibus.

Discovered by Dr. Coulter on the mountains of Santa Lucia, near the Mission of San Antonio, in latitude 36°, within sight of the sea and at an elevation of from 3000 to 4000 feet above its level. It was growing intermingled with *Pinus Lambertiana.* The tree rises to the height of 80 or 100 feet, with large permanent spreading branches, and the trunk is 3 or 4 feet in diameter. The leaves are longer and broader than those of any other Pine, and the cones

which grow singly are the largest of all, being often more than a foot long, half a foot in diameter, and weighing about four pounds. The spinous processes of the scales of the cone are very strong, hooked and compressed, 3 or 4 inches in length, and about the thickness of one's finger, characters which essentially distinguish it from *P. Sabiniana,* described in the 16th volume of the Society's Transactions. These, together with the following species, and *P. pungens* of Michaux, constitute a very distinct section characterized by their permanent cones, with the points of the scales elongated and spinous.

At the suggestion of Mr. Lambert I have applied to this remarkable tree the name of its discoverer, who is no less distinguished for his scientific acquirements than for the excellent qualities of his mind.

2. Pinus muricata.

P. foliis ternis? strobilis inæquilateri-ovatis aggregatis: squamis cuneatis apice dilatatis umbilico elevato mucronatis; baseos externæ elongatis ancipiti-compressis recurvato-patentibus.

Habitat in Californiâ ad locum San Luis Obispo Hispanicè dictum, alt. 3000 ped. *Coulter*. ♄. (v. s. sp.)

Arbor recta, mediocris, altitudine circiter 40 pedes. *Strobili* aggregati (2. v. 3.), inæquilateri-ovati, 3-pollicares: *squamis* cuneatis, crassissimis, apice dilatatis, obsoletè 4-angularibus, umbilico elevato mucronatis; baseos externæ elongatis, ancipiti-compressis, callosis, rigidis, lævibus, nitidis, recurvato-patentibus.

This belongs to the same group as the preceding. The cones are much the smallest of the section, being not larger than those of *P. inops,* and are remarkable for the great degree of development of the scales at their external base.

Found by Dr. Coulter at San Luis Obispo in latitude 35°, and at an elevation of 3000 feet above the level of the sea, from which the locality is distant about ten miles. The tree is straight and rather stunted, not exceeding 40 feet in height. The cones grow two or three together. I regret that I have not seen the leaves of this and the two following species; but it is probable that, like the greater part of the American Pines, they grow in threes.

3. Pinus radiata.

P. foliis ternis? strobilis inæquilateri-ovatis: squamis radiato-rimosis umbilico depresso truncatis; baseos externæ triplò majoribus gibbosis subrecurvis.

Habitat in Californiâ, in maris littore ad Monterey. *Coulter.* ♄. (v. s. sp.)

Arbor rectissima, altitudinem circiter 100 pedes attingens, ramis latè patentibus copiosis ad basin usque ornata. *Strobili* aggregati, ovati, 6-pollicares, basi exteriore ventricosi: *squamis* cuneatis, crassis, spadiceis, nitidis, apice dilatatis, depressis, quadrangulis, radiato-rimosis, umbilico depresso; ad basin exteriorem triplò majoribus, apicibus elevatis, gibbosis, subrecurvis.

Found by Dr. Coulter about Monterey in latitude 36°, near the level of the sea, and growing almost close to the beach. The trees grow singly together, and reach the height of 100 feet, with a straight trunk, feathered with branches almost to the ground. It affords excellent timber, which is very tough, and admirably adapted for building boats, for which purpose it is much used.

4. Pinus tuberculata.

P. foliis ternis? strobilis inæquilateri-oblongis aggregatis: squamis apice quadrangulis umbilico depresso truncatis; baseos externæ majoribus elevatis conicis.

Habitat in Californiâ, in maris littore ad Monterey. *Coulter.* ♄. (v. s. sp.)

Arbor 100-pedalis. *Strobili* oblongi, aggregati (3), fulvo-cinerei, 4-pollicares, 2½ uncias crassitie adæquant: *squamis* cuneatis, apice dilatatis, quadrangularibus, umbilico depresso truncatis, ad basin exteriorem majoribus apice elevatis, conicis.

Found by Dr. Coulter along with the preceding, which it resembles in size and habit, but is essentially distinguished by the form of its cones.

5. Pinus bracteata.

P. foliis solitariis bifariàm patentibus linearibus mucronatis planis subtùs ar-

genteis, strobilis ovatis, bracteolis trilobis; laciniâ intermediâ longissimâ foliaceâ recurvatâ.

Habitat in Californiâ, in montibus Sanctæ Luciæ, alt. 3000 ped. *Coulter.* ♄. (v. s. sp.)

Arbor elongato-pyramidata. *Truncus* rectissimus, gracillimus, 120 pedes altus, crassitie ad basin vix pedali, tertiâ parte superiore ramis tantùm onustus, cortice badio obductus. *Rami* verticillati, patentes; *inferiores* leviter decumbentes. *Folia* conferta, undique inserta, bifariàm tamen patentia, linearia, mucronata, plana, coriacea, rigida, bi- v. nunc ferè tri-pollicaria, lineam circiter lata, suprà lætè viridia, nitida, lineâque depressiusculâ exarata, subtùs argentea, margine parùm revoluta, costâ apiceque callosis. *Strobili* in ramis tantùm adultioribus solitarii, laterales, subsessiles, erecti, ovati, turgidi, vix 4-pollicares, diametro 2-unciales, basi squamis pluribus ovato-oblongis, acutis, scariosis, laceris, spadiceis, revolutis, persistentibus muniti: *squamis* reniformi-rotundatis, concavis, stipitatis, substantiâ crassis, induratis, pallidè fuscis, margine incurvis, crenulatis, extùs rore glauco cœrulescentibus, stipite suprà acutè carinatâ, disco breviore. *Bracteæ* cuneatæ, adpressæ, coriaceæ, rigidæ, squamis concolores et iisdem breviores, infernè adnatæ et callosæ, apice trilobatæ; *lobis lateralibus* brevissimis, rotundatis, erosè dentatis; *intermedio* recurvato, sesquipollicari, foliis propriis omninò conformi! sed duplò angustiore. *Semina* cuneato-oblonga, tetragona; *testâ exteriore* (priminâ) cinereo-fulvâ, angulo interno disjunctâ, apertâ, ibique nucleum exponente, apice in alam inæquilateri-obovatam, integerrimam, tenuissimè membranaceam, planam, reticulatam extensâ. *Nucleus* testâ propriâ (secundinâ) crustaceâ sordidè fuscâ inclusus, apice alâ brevissimâ membranaceâ erosâ coronatus.

This curious and interesting species of Fir was discovered by Dr. Coulter on the sea side of the mountain range of Santa Lucia, about 1000 feet lower down than *Coulteri.* The trunk rises to the height of 120 feet, is very slender, not exceeding two feet in circumference, and as straight as an arrow. The upper third of the tree is clothed with branches, giving it the appearance of an elongated pyramid. The branches are spreading, the lower ones are decumbent. The bractes are long and recurved, and but little changed from

the ordinary leaves, which give the cones a singular appearance. The seeds are remarkable for a peculiarity in their structure, in having the nucleus exposed at the inner angle of the seed through a considerable opening in the outer testa, as if the junction of the two sides had been prevented by the rapid enlargement of the nucleus*. It is only the middle branches that bear cones.

* This peculiarity in the structure of the seeds I have since noticed also in *P. Webbiana*, and in several other species belonging to the group of silver firs.

XXV. *Some Account of the Galls found on a Species of Oak from the Shores of the Dead Sea.* *By* AYLMER BOURKE LAMBERT, *Esq., F.R.S. V.P.L.S., &c.*

Read June 2, 1835.

SOME time ago I had the honour to submit to the Society the branch of a shrub from Monte Video bearing Galls containing a new insect brought by Mr. Earle, who accompanied Captain Fitzroy in the 'Beagle.' I have now the pleasure to exhibit specimens and a drawing of the far-famed apples "*Mala insana*" from the mountains east of the Dead Sea, and which now proves to be a Gall on a species of oak, containing an insect. These Galls were brought home by the Hon. Robert Curzon, who has lately returned from the Holy Land. They are the first that have been seen in England, and will enable us to clear up the many great mistakes that have been made by travellers about them. Mr. Curzon tells me the tree that produces them grows in abundance on the mountains in the neighbourhood of the Dead Sea, and is about the size of our apple-tree. It is, perhaps, the "Quercus foliis dentato-aculeatis" mentioned by Hasselquist as growing on Mount Tabor (*Trav. p.* 281.). There appear to be two or three different plants for whose fruit these Galls have been mistaken, viz. *Solanum sodomeum,* which appears to have been confounded with *Solanum Melongena,* and *Calotropis gigantea,* &c. &c. I shall refer to what Hasselquist says (p. 287.) of the *Mala insana,* and likewise the account given of it in that useful work, the Modern Traveller, by Mr. Conder, who seems to have brought together all that has been said or written on this most interesting subject: and what is very extraordinary, and greatly to the praise of that gentleman,—having probably never seen the production itself,—he rightly guessed its real nature. Mr. Curzon informs me these Galls when on the tree are of a rich purple, and varnished over with a soft substance of the consistence of honey, shining with a most brilliant lustre in the sun, which makes the Galls appear like a most delicious and tempting fruit. Having had

the curiosity to taste a small quantity of the interior of one, I found it the strongest of bitters, and that it may truly be said of it, "as bitter as gall."

The Gall is pear-shaped, with a circle of small sharp-pointed protuberances on the upper part of it, which appear to be formed by the insect for air or defence, or some other purpose. In each of the Galls there is an aperture through which the insect escapes, and in the centre there is a small round hole, or *nidus*, where it has lodged.

Since writing the above, I find the leaves of the oak to be those of *Quercus infectoria*, which is accurately figured in Olivier's Travels in the Levant, and that the Galls are identical with those of commerce. The tree grows abundantly throughout Syria. The insect has been named by Olivier *Diplolepis*; and it is also accurately figured by him in the above-mentioned work, but he does not appear to have been aware of the Galls being the same with the *Mala insana*.

The following are extracts from Conder's Modern Traveller:

"There yet remains to be noticed, in connexion with this subject, the far-famed apples

"which grew
Near that bituminous lake where Sodom stood."

Tacitus and Josephus both mention this fruit as beautiful to the eye, but crumbling at the touch to dust and bitter ashes*. Reland, Maundrell and Shaw all express themselves as sceptical concerning its existence. But none of them explored the borders of the lake sufficiently to entitle them to give a decided opinion on the subject, having only seen its northern shore. Pococke is inclined to lay more stress on the ancient testimonies; and he supposes the apples to be pomegranates, "which having a tough, hard rind, and being left on the trees two or three years, the inside may be dried to dust, and the outside may remain fair." Hasselquist however, the pupil of Linnæus, pronounces the *Poma sodomitica* to be the fruit of the *Solanum Melongena*, (Egg-

* Book of Wisdom, chap. x. verse 7.—" . . . . of whose wickedness even to this day the waste land that smoketh is a testimony, and plants bearing fruit that never come to ripeness: and a standing pillar of salt is a monument of an unbelieving soul."

† See also Wisdom x. 7.

plant Nightshade, or Mad-apple,) which he states to be found in great abundance round Jericho, in the valleys near the Jordan, and in the neighbourhood of the Dead Sea. "It is true," he says, "that these apples are sometimes full of dust, but this appears only when the fruit is attacked by an insect (*Tenthredo*), which converts the whole of the inside into dust, leaving nothing but the rind entire, without causing it to lose any of its colour." M. Seetzen, differing from Hasselquist in opinion, supposes the apple of Sodom to be the fruit of a species of cotton-tree, which, he was told, grows in the plain of El Ghor, in appearance resembling a fig-tree, and known by the name of *Abeschaez*. The cotton is contained in the fruit, which is like a pomegranate, but has no pulp. Chateaubriand follows with his discovery of what he concludes to be the long-sought fruit. The shrub which bears it, he says, grows two or three leagues from the mouth of the Jordan: it is thorny, with small taper leaves, and its fruit is exactly like the little Egyptian lemon both in size and colour. "Before it is ripe it is filled with a corrosive and saline juice: when dried it yields a blackish seed, which may be compared to ashes, and which in taste resembles bitter pepper." He gathered half a dozen of these fruits, but has no name for them either popular or botanical. Next comes Mr. Jolliffe. He found in a thicket of brushwood, about half a mile from the plain of Jericho, a shrub five or six feet high, on which grew clusters of fruit, about the size of a small apricot, of a bright yellow colour, "which, contrasting with the delicate verdure of the foliage, seemed like the union of gold with emeralds. Possibly, when ripe, they may crumble into dust upon any violent pressure." Those which this gentleman gathered did not crumble, nor even retain the slightest mark of indenture from the touch; they would seem to want, therefore, the most essential characteristic of the fruit in question. But they were not ripe. This shrub is probably the same as that described by Chateaubriand. Lastly, Captains Irby and Mangles have no doubt that they have discovered it in the oskar plant, which they noticed on the shores of the Dead Sea, grown to the stature of a tree, its trunk measuring, in many instances, two feet or more in circumference, and the boughs at least fifteen feet high. The filaments inclosed in the fruit somewhat resemble the down of a thistle, and are used by the natives as a stuffing for their cushions; "they likewise twist them, like thin rope, into matches for their guns, which, they

assured us, required no application of sulphur to render them combustible." This is probably the same tree that M. Seetzen refers to. But still the correspondence to the ancient description is by no means perfect; there being little resemblance between cotton or thistle-down, and ashes or dust. M. Chateaubriand's golden fruit, full of bitter seed, comes the nearest to what is told us of the deceitful apple. If it be anything more than a fable, it must have been a production peculiar to this part of Palestine, or it would not have excited such general attention. On this account the *Oskar* and *Solanum* seem alike unentitled to the distinction; and for the same reason, the pomegranate must altogether be excluded from consideration. The fruit of the *Solanum Melongena*, which belongs to the same genus as the common potato, is white, resembling a large egg, and is said to impart an agreeable acid flavour to soups and sauces, for the sake of which it is cultivated in the South of Europe. This could hardly be what Tacitus and Josephus referred to. It is possible, indeed, that what they describe may have originated, like the oak-galls in this country, in the work of some insect: for these remarkable productions sometimes acquire a considerable size and beauty of colour. Future travellers will be inexcusable if they leave this question undecided."

EXPLANATION OF TAB. XXII.

Fig. 1. Leaf.
2. Ditto to show the under side.
3. Branch bearing a gall.
4. Gall separate.
5, 5. Sections of a gall.

J. T. Hart del.

H. Weddell sc.

Note on the Mustard Plant of the Scriptures. By Mr. Lambert.

I beg leave to offer also to the notice of the Society a few observations relating to the Mustard Plant of the Scriptures, about which so many doubts have been raised. I am convinced it is the mustard now in daily use among us. Mustard-seed was used by the Romans and other nations of antiquity in medicine, as it is at this day. I shall endeavour to prove from the New Testament that the *Sinapis nigra* is the plant our Saviour alludes to in Matthew, chap. xiii. verses 31 and 32. "Another parable put he forth unto them, saying, The kingdom of heaven is like to a grain of mustard-seed, which a man took, and sowed in his field: which indeed is the least of all seeds: but when it is grown, it is the greatest among herbs, and becometh a tree, so that the birds of the air come and lodge in the branches thereof." Likewise in another part, Mark, chap. iv. verses 31 and 32. "It is like a grain of mustard-seed, which, when it is sown in the earth, is less than all the seeds that be in the earth: but when it is sown, it groweth up, and becometh greater than all herbs, and shooteth out great branches; so that the fowls of the air may lodge under the shadow of it." Our Saviour is not to be understood as speaking scientifically or specifically when he said, the smallest of seeds; he was speaking only comparatively, and meant no more than a small seed; and when he spoke of it as the greatest of herbs, and becoming a tree, he may be supposed to have meant no more than that it bore a resemblance to a tree of low stature: its branches would give it the appearance of a tree, and small birds might lodge or rest upon it.

Now in the two last verses quoted we find it described as being a great herb, and branched, so that the fowls of the air might lodge under it, as the partridge and quails do under our corn. The following passage in Luke, chap. xvii. verse 6. "And the Lord said, If ye had faith as a grain of mustard-seed," plainly shows it was a grain in common use, and he therefore chose it as his figure, that it might be understood by the meanest capacity. What Mr. Frost says about the *Phytolacca* he took from some conversation he heard in my library, not relating to the Mustard-seed of Scripture, but to a plant mentioned by Captains Irby and Mangles, of which they brought me a specimen, and which proved to be *Salvadora persica,* found by them growing in a hot valley

of the Holy Land, although a very common plant in the East Indies. Now as there is but one mustard-seed mentioned in three different places in the Scriptures, the oldest records appear to prove that the mustard so common in those days, and to which our Saviour so often alludes, was a species of *Sinapis*, and most probably *Sinapis nigra.*

Captains Irby and Mangles inform me they have seen our Mustard plant in the Holy Land growing as high as their horses' heads; and other travellers have seen the *Sinapis nigra* growing to the height of ten feet.

XXVI. *On several new or imperfectly understood British and European Plants.* *By* Charles C. Babington, *M.A., F.L.S. F.G.S., &c.* *In a Letter to* Edward Forster, *Esq., V.P.L.S., &c. &c.*

Read December 1st and 15th, 1835.

My dear Sir,

If the following observations on a few newly discovered or imperfectly understood British and European plants appear to you worthy of being communicated to the Linnean Society, I should feel much obliged by your submitting them to that body at an early meeting. I may be allowed to add, that I am indebted to our mutual friend W. Borrer, Esq., F.L.S., &c. for drawing my attention to the subject, and granting me the use of his library and extensive herbarium in its elucidation.

I am, &c.

Charles C. Babington.

St. John's College, Cambridge,
October 13th, 1835.

To E. Forster, Esq., V.P.L.S., &c. &c.

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1. *Herniaria hirsuta.* Linn.

Caulibus herbaceis prostratis pilis patentibus hirsutis, foliis ovali-oblongis, florum sessilium glomerulis axillaribus.

H. hirsuta. *Linn. Herb.*; *Sp. Pl.* 317. *Huds. Fl. Angl.* i. 109. *Engl. Bot.* 1379. *DeCand. Prodr.* iii. 367. *Pers. Syn.* i. 292. *Sm. Engl. Fl.* ii. 9. *Bot. Gall.* i. 197. *Hooker, Brit. Fl. ed.* 3. 144.

Hoary Rupture-wort. *Petiv. Herb.* x. 10.

Densely hairy throughout; *stems* covered with straight spreading hairs, giving the plant a grey tinge; *flowers* large in comparison with the following species, but fewer in number in each cluster; *calyx* covered with strong

prominent hairs, so as to appear when closed like a little bur; each *sepal* ovate-lanceolate, blunt, with a diaphanous margin; *petals* and *stamens* rising from a fleshy disk, the former resembling the filaments of the anthers, but alternate with them, and, as it appears to me, in an exterior whorl; *stipules* large, acute, membranous, ciliated.

On gravelly ground, near Colney Hatch, Barnet. *Hudson*, ♃.? July, August.

Mr. E. Forster suspects that this plant is only annual. Messrs. Milne and Gordon in their Indigenous Botany, i. 455, say, "We found it in a field at Finchley and at Colney Hatch near Barnet, where Hudson observed it." It has not, I believe, been found since the publication of that work in 1793.

2. *H. glabra.* Linn.

Caulibus herbaceis prostratis pilis minutissimis retrorsùm arcuatis tectis, foliis ovali-oblongis glabris, florum sessilium glomerulis axillaribus.

H. glabra. *Linn. Herb.*; *Sp. Pl.* 317. *Huds. Fl. Angl.* i. 108. *Fl. Dan.* 529. *Engl. Bot.* 206. *DeCand. Prodr.* iii. 367. *Pers. Syn.* i. 292. *Sm. Engl. Fl.* ii. 8. *Bot. Gall.* i. 197. *Hooker, Brit. Fl. ed.* 3. 144.?

Whole plant of a pale yellowish green; *stems* thickly covered with very minute curved hairs, pointing downwards; *flowers* much smaller than in *H. hirsuta*, and more numerous in each of the clusters, which are set so closely on the lateral branches as to present the appearance of a long leafy spike; *calyx* glabrous; *sepals* oblong-ovate, rather acute; *corolla* and *stamens* as in the last; *stigmas* small; *stipules* lanceolate, acute, membranous, slightly ciliated.

The description given under *H. glabra* in Dr. Hooker's *Brit. Fl.* belongs to *H. ciliata*, as does the Cornish locality. In Sir J. E. Smith's herbarium three specimens are preserved on one paper as *H. glabra*; No. 1. "Herb. D. Rose," which is correct; No. 2. from Cornwall, and No. 3. from Halle, both of which belong to my *H. ciliata*, described below. Gaudin, *Fl. Helv.* ii. 243. describes the clusters as opposite to the leaves, but I suspect that he has taken the lateral branches mentioned above for single clusters, in which case they would appear to be opposite.

Near Newmarket. *Rev. Mr. Hemsted.* ♃.

3. *H. ciliata.*

Caulibus herbaceis prostratis pilis minutissimis retrorsùm arcuatis tectis, foliis ovatis ciliatis, florum sessilium glomerulis axillaribus.

H. glabra. *Gussone, Prodr. Fl. Sicul.* i. 293.

Herniaria. *Raii Syn.* 160.

Smooth Rupture-wort. *Pet. Herb.* x. 9.

Whole plant dark green; *stems* covered with minute curved hairs, as in the last species, but much less thickly; *flowers* smaller than in *H. hirsuta,* and more numerous in each of the clusters, which do not coalesce as in *H. glabra,* but form small distinct masses, each consisting of two or three clusters; *sepals* ovate, generally with a strong hair at their apex, and also having a few very minute scattered hairs upon them; *corolla* and *stamens* as in *H. hirsuta*; *stigmas* much larger than in *H. glabra* and more divergent; *leaves* strongly ciliated, and sometimes with a few hairs on their disk, sessile; *stipules* shorter than in the last and more ciliated.

The description of *H. glabra* in Dr. Hooker's *Brit. Fl.* belongs to this species. Ray quotes *Ger.* 454. not *Ger. Emac.* 569.; the latter is probably *H. glabra*; the former is much like *H. hirsuta.*

Near the Lizard Point, Cornwall. *Ray.* I have specimens from thence through the kindness of Mr. Borrer. ♃.

4. *Crepis virens.* Linn.

Involucro pappum subæquante, foliis glabris lanceolato-runcinatis vel remotè dentatis: caulinis margine planis, acheniis oblongis pappo brevioribus: costis lævibus.

C. polymorpha. *Wallr. Sched. Crit.* i. 426. *Roth, Manuale Bot.* iii. 1116.

C. virens. *Gaud. Fl. Helv.* v. 141.

α. vera. Leaves lanceolate-runcinate, cauline ones lanceolate, sinuato-dentate, or nearly entire, sagittate; stem erect, branched above.

C. virens. *Linn. Sp. Pl.* ii. 1134. *DeCand. Fl. Fr.* v. 447.; *Bot. Gall.* i. 299.

C. tectorum. *Huds. Fl. Angl. ed.* i. 301. *With. Bot. Arr.* iii. 689. (excl. *var.* 4. and latter part of descr.) *Sm. Fl. Brit.* ii. 837. *Curt. Fl. Lond.* v. 55. (good.) *Engl. Bot.* 1111. *Sm. Engl. Fl.* iii. 372. *Hooker, Brit. Fl. ed.* 3. 352. *Lindl. Syn. ed.* 2. 158.

Hedypnois tectorum. *Huds. Fl. Angl. ed.* 2. 341.

C. polymorpha β. virens. *Wallr. l. c. Bluff. et Fingerh. Fl. Germ.* ii. 300. *Roth, Manuale Bot. l. c.*

C. virens, *var.* (*). *Pers. Syn.* ii. 377.?

Common Hawkbeard. *Pet. Herb.* xii. 6.

β. *pinnatifida.* Radical leaves broadly ovate, blunt, remotely dentate, cauline ones linear-lanceolate, very deeply divided into numerous long linear segments, the uppermost nearly entire, sagittate; stem erect, branched above.

C. pinnatifida. *Willd. Sp. Pl.* iii. 1604.

C. virens. *Hoffm. Fl. Germ.* ii. 281.

Succory Hawkbeard. *Pet. Herb.* xii. 7.

γ. *stricta.* Wallr. Leaves linear-lanceolate, remotely dentate, cauline ones slightly sagittate; stem erect, branched above.

C. stricta. *Scop.* ii. 99. "*DC. Cat. Hort. Monspel.* 99."

C. polymorpha α. stricta. *Wallr. l. c.*

Buddle's Hawkbeard. *Pet. Herb.* xii. 5.

δ. *diffusa.* Wallr. Leaves remotely dentate, sinuate or runcinate, cauline ones linear, nearly entire, hardly sagittate; stem diffuse, branching at the base.

C. tectorum var. 4. *With. Bot. Arr.* iii. 690.

C. diffusa. "*DC. Cat. Hort. Monspel.* 99." *Fl. Fr.* v. 448. *Spreng. Syst.* iii. 634. *Bot. Gall.* i. 299. *Bluff. et Fingerh. l. c.*

C. virens. *Willd. Sp. Pl.* iii. 1604. *Pers. Syn.* ii. 376.

C. polymorpha γ. diffusa. *Wallr. l. c. Roth, l. c.*

Dandelion Hawkbit. *Pet. Herb.* xii. 4.?

Stem furrowed, smooth, purplish; in *var.* α., β., γ., upright, branched above, 1 or 2 feet high: in δ. branched at the base, the branches diffuse, often prostrate; *leaves* glabrous, very variable in size and form; the radical ones narrowing below into a winged petiole, which is generally purple on its under side, simply toothed, runcinate or runcinato-dentate, usually rounded at the end, sometimes acute; cauline ones in *var.* α. slightly runcinate, the upper ones nearly entire, sagittate: in *var.* β. linear-lanceolate, deeply divided into numerous, long, linear, patent segments, the few uppermost nearly entire, sagittate: in *var.* γ. broadly linear-lanceolate,

nearly entire, slightly sagittate: in *var.* δ. all small, linear, nearly entire, hardly sagittate; *involucrum* oval when in bud, becoming afterwards ventricose, equalling the pappus, its outer scales adpressed, few, small, short; *flowers* small, generally variegated with purple on the outside; *fruit* oblong, not attenuated, ribbed, smooth, shorter than the pappus.

The above-mentioned varieties are so completely connected by intermediate forms that it is often quite impossible to determine to which of them a particular specimen ought to be referred; but as they have been adopted as species by some Continental authors, I have thought it right to define their most marked forms. The specimen of *C. virens* in the Linnæan herbarium is of no authority, being without the usual marks of authenticity. In the Smithian herbarium is a specimen which belongs here, sent by Dr. Schrader as probably the *C. virens* of Linnæus, but referred by Sir J. E. Smith to *C. tectorum.*

Very common on walls, banks, &c. ⊙. July, September.

5. *C. tectorum.* Linn.

Involucro pappum subæquante, foliis glabris sinuato-pinnatifidis: caulinis linearibus sagittatis margine revolutis, acheniis oblongo-attenuatis pappo æqualibus: costis scabris.

C. tectorum. *Linn. Herb.*; *Sp. Pl.* ii. 1135. *Fl. Dan.* 501. *Willd. Sp. Pl.* iii. 1601. *DeCand. Fl. Fr.* v. 448.; *Bot. Gall.* i. 300. *Pers. Syn.* ii. 376. *Wallr. Sch. Crit.* i. 430. *Lachmann, Fl. Brunsv.* ii. 2. 184. *Endlicher, Fl. Poson.* 293. *Gaud. Fl. Helv.* v. 139. (excl. syn. Smith.)

Very similar to the last, which has been mistaken for it by all British botanists (except Mr. Joseph Woods, to whom I am indebted for directing my attention to their differences,) but it may be at once distinguished by attending to the structure of the fruit, which is very long, equalling the pappus, attenuated above, its ribs rough; the margin also of the upper leaves is revolute, that not being the case in *C. virens.* Wallroth refers *C. Lachenaultii*, DeCand. *Fl. Fr.* v. 449. and *Bot. Gall.* i. 300. to this species, but being totally unacquainted with that plant I cannot form an opinion upon the subject. The specimens preserved in the Smithian herbarium under the name of *C. tectorum*, all belong to *C. virens*, and are from Dauphiny and Switzerland.

This plant does not appear to be a native of Britain. ⊙.

6. *C. biennis.* Linn.

Involucro pappo breviore, foliis hispidis runcinato-pinnatifidis, acheniis oblongo-linearibus attenuatis pappo subæqualibus: costis lævibus.

C. biennis. *Auct.* *Engl. Bot.* 149.

I need only add to Sir J. E. Smith's excellent description, in *Engl. Fl.* iii. 373., that the involucrum is ovate-oblong both when in flower and in seed, not becoming ventricose as in *C. virens.* ♂.

7. *Erica Tetralix.* Linn.

Foliis quaternis revoluto-linearibus ciliatis suprà tomentosis, floribus capitatis pedicellatis, sepalis linearibus ciliatis pedicellisque tomentosis, corollâ ovatâ, antheris aristatis inclusis, stylo subincluso.

E. Tetralix. *Auct.*

Stems branched only towards their base. *Leaves* and *sepals* linear-lanceolate, downy, their margins recurved so as almost to meet behind. ♄.

8. *E. Mackaiana.*

Foliis quaternis ovatis ciliatis suprà glabris, floribus capitatis pedicellatis, sepalis ovatis ciliatis glabris, pedicellis pilosis et tomentosis, corollâ oblongo-ovatâ, antheris aristatis inclusis, stylo exserto.

Stem erect, about a foot high, leafy, downy, densely branched from top to bottom. *Leaves* spreading, 4 in a whorl, stalked, ovate, their margins slightly revolute, glabrous, ciliated, white beneath. *Flowers* capitate, erect or pendulous, of a rather dark rose colour, on downy stalks, upon which are also a number of long silvery hairs, generally glandular: *sepals* ovate, ciliated, glabrous; *corolla* oblong-ovate; *anthers* inclosed, awned at their base; *style* exserted.

Distinguished from *E. Tetralix* by the form and structure of its leaves and sepals, the glabrous upper surface of the former, and its total difference in habit. It agrees with *E. ciliaris* in the character of its foliage, but differs

from that plant by having its anthers awned, and by other less marked characters.

Gathered by me on Craigha Moïra, Connamara, Ireland, in August 1835, where it covers several acres of rocky ground: my attention was directed to it as perhaps a new British heath by Mr. William MacCalla of Roundstone. I name it, in accordance with a suggestion of Dr. Hooker's, in honour of Mr. J. T. Mackay, the eminent botanist to whom we owe the discovery of *E. mediterranea* in Ireland.

There appears to be some doubt as to the specific distinctness of this plant, several of our best botanists (who have not seen it in its native locality,) being of opinion that it is only a very marked variety of *E. Tetralix.* I cannot, however, concur in that idea, as I noticed no intermediate states, although the latter was growing in the greatest luxuriance within a few yards of *E. Mackaiana.* I may also remark that *E. Tetralix* gradually dwindled in proportion to the dryness of the soil; and that *E. Mackaiana* did the same when, leaving the rock, it encroached upon the bog by which it was surrounded, and on which its ally was remarkably flourishing; neither of them changing at all in character, but only in size and luxuriance. ♄. August, September.

9. *Polygonum maritimum.* Linn.

Caule procumbente basi sublignoso, ochreis 2-partitis lanceolatis demùm laceris ramoso-nervatis, foliis lanceolatis subcarnosis, floribus axillaribus, cariopside lævissimâ perianthio longiore.

P. maritimum. *Linn. Sp. Pl.* 519. *Willd. Sp. Pl.* ii. 449. *Spreng. Syst.* ii. 256. *Pers. Syn.* i. 439. *DeCand. Fl. Fr.* iii. 368.; *Bot. Gall.* i. 405. *Gussone, Prodr. Fl. Sicul.* i. 469. *Meisner, Mon. Polyg. Prodr.* 89.

Root woody, as well as the lower part of the stem, which is branched, round, striated, with numerous joints; *leaves* alternate, lanceolate, generally acute, their margin revolute, coriaceous, longer than the internodes; *stipules* membranous, bipartite, at length torn so as to appear fringed, about equal to the internodes, with numerous ribs, which are branched at their base; *flowers* axillary, 2 or 3 together, double the size of those of *P. aviculare*; *sepals* 4 or 5, white, broadly marked with green in the middle; *stamens* 7 or 8, the 3 inner filaments very broad at their base;

styles 3, short, divergent, with round blunt stigmas; *fruit* triangular, longer than the perianth, quite smooth and shining.

The British specimens of this plant differ from the foreign ones by having the stipules rather shorter than the joints of the stem, with fewer ribs; in every other point they are exactly similar.

At Christchurch Head on the sandy shore towards Muddiford. *Mr. Borrer,* to whom I am indebted for specimens. I have it also from Herm Bay, Jersey, gathered by Mr. W. C. Trevelyan. ♃.

10. *P. Raii.*

Caule procumbente herbaceo, ochreis 2-partitis ovatis demùm laceris venis paucis distantibus simplicibus, floribus axillaribus, cariopside lævissimâ perianthio longiore.

P. marinum. *Raii Syn.* 147. (excl. syn.)

P. aviculare ε. maritimum. *Huds. Fl. Ang.* i. 171. (excl. syn.) *Sm. Engl. Fl.* ii. 238.

P. aviculare β. *Hooker, Brit. Fl. ed.* 3. 185.

This plant appears to be exactly intermediate between *P. maritimum* and *aviculare,* agreeing with the first in its fruit, and with the second in its habit and stipules, which latter are much shorter than the internodes, and have very few, about 2, unbranched distant nerves; the leaves are longer than the internodes on the young shoots, but shorter on the old ones; the margins of the younger ones are slightly revolute; *flowers* as large as those of *P. maritimum*; *fruit* much longer than the perianth, quite smooth and shining, not striated with raised points, and quite hidden by the perianth as in *P. aviculare.*

The synonyms from the old authors, given by Ray, are referred by Sir J. E. Smith to *P. maritimum,* in which he is probably correct; but it is a point very difficult to determine on account of the bad custom which then prevailed of using the same blocks both in British and foreign works. I have not been able to ascertain whether "*P. Roberti* of Loiseleur," which Mr. Woods finds so similar to our plant as to be perhaps the same species, is published or merely named in manuscript. Mr. Woods's specimens are from the South of

France. It has also been suggested that our plant may be *P. littorale*, Link, noticed but not described in Schrader's Bot. Journ. for 1800, page 54, and referred by Sprengel to *P. flagellare*, Bertoloni; but the description given by Sebastiani and Mauri in the *Prodromus Floræ Romanæ* (from Bertoloni's manuscripts) proves that plant to have woody perennial stems and longish peduncles, and they quote as a synonym "*P. angustifolium majus*," Barr. Obs. 1141. ic. 546., which is manifestly a very slight variety of *P. maritimum*. Gussone in his *Fl. Sicul. Prodr.* says, under *P. maritimum*, "An *P. littorale* Link En. alt. H. Ber. i. p. 385., quod ad *P. flagellare* adducitur à cl. Spr. in Sy. Veg. ii. p. 295. potius *P. maritimum* varietas est?" I may also add, that *P. flagellare* is not described as a maritime plant, and has, according to Meisner, its fruit granulato-striate. It is his var. *γ. romanum* of *P. aviculare*. Bluff and Fingerhuth in their *Comp. Fl. Germ.* i. 500. refer Link's plant to their "*P. aviculare β. littorale*," and describe it as found "ad litt. mar. baltici"; I should suppose that their plant is only the maritime variety of *P. aviculare*, and that their reference to Link is erroneous. Meisner refers this plant to *P. maritimum*, as a synonym, not even considering it to rank as a variety.

Between Marazion and Penzance. *Mr. Borrer*, first noticed by Ray. Portmarnock sands, Dublin. *Dr. Taylor*. Near Barmouth, North Wales. *Rev. T. Salwey*. Between Abermenai and Llanddwyn, Anglesea, the reported place by Dillenius on the authority of Mr. Lhwyd, and on the Killiney sands near Dublin. The Dillenian station at "Brakelsham in Sussex," I am informed by Mr. Borrer has been long since destroyed by the sea. ⊙. August, September.

11. *P. dumetorum*. Linn.

Caule volubili tereti, ochreis brevibus subacutis, foliis triangulari-cordatis petiolatis, racemis axillaribus elongatis, floribus longè pedicellatis, cariopside triquetrâ lævissimâ pendulâ perianthio persistente triptero tectâ.

Convolvulus niger. *Dodon. Pempt.* 396. *f.* 1. (good.)

P. caule volubili, foliis sagittatis, valvulis seminalibus alatis. *Hall. Helv.* 1562.

P. dumetorum. *Linn. Sp. Pl.* 522. *Flor. Dan. t.* 756. *Willd. Sp. Pl.* ii. 455. *Spreng. Syst.* ii. 254. *DeCand. Fl. Fr.* iii. 371.; *Bot. Gall.* i. 408. *Gaud. Fl. Helv.* iii. 48. *Meisner, Mon. Polyg. Prodr.* 63.

Stem 5 or 6 feet high, round, striated, branched, smooth, not scabrous; *leaves* alternate, stalked, triangularly cordate; *racemes* axillary and terminal, lax, elongated; *flowers* with long stalks, when in fruit reflexed, the fruit triquetrous, oblong, quite smooth and shining, covered by the very broadly winged persistent enlarged perianth, which is shorter than its jointed footstalk.

Found September 20, 1834, in a wood at Wimbledon, by *Mr. J. A. Hankey*, who kindly presented me with a specimen. Some doubts having been expressed as to its identity with *P. dumetorum*, Linn., I was induced, on obtaining additional specimens from my friend *Mr. C. E. Broome*, gathered at Wimbledon by Mr. W. W. Saunders, to submit it to a rigid examination, and have determined that the synonyms given above belong truly to the Wimbledon plant. ⊙. September.

12. ***P. Convolvulus.*** Linn.

Caule volubili angulato, ochreis brevibus subtruncatis, foliis hastato-cordatis acuminatis petiolatis, racemis axillaribus, floribus pedicellis brevibus, cariopside triquetrâ granulato-striatâ perianthio persistente tricarinato involutâ.

P. Convolvulus. *Auct.*

Stems seldom more than 2 feet high, angular, branched, rough; *leaves* hastate-cordate; *fruit* triquetrous, ovate, rough with minute elevated points, not shining, covered by the bluntly keeled, not winged, persistent, enlarged perianth, which is longer than its footstalk. ⊙. July—September.

13. ***Euphorbia pilosa.*** Linn.

Umbellâ irregulari subquinquefidâ trifidâ bifidâ, bracteis omnibus ellipticis omninò glabris, glandulis involucri 4 subrotundis, foliis lato-lanceolatis sessilibus apice tenuissimè serrulatis subtùs pilosis, capsulis plùs minùsve verrucosis et pilosis, seminibus obovatis minutissimè punctatis lævibus.

α. pilosa.

E. pilosa. *Linn. Herb.*; *Sp. Pl.* i. 659. *Willd. Sp. Pl.* ii. 917. *Bluff. et Fingerh.* ii. 449. *Bot. Gall.* i. 414. *Engl. Bot. Suppl. t.* 2787. *Lindl. Syn. ed.* 2. *p.* 329.?

E. pilosa β. *Hook. Brit. Fl. ed.* 3. 388.

E. epithymoides. *Bab. Fl. Bath.* 44. (non *Linn.*)

β. procera.

E. procera. *M. Biebers. Cauc.* i. 378.

E. villosa. *Waldst. et Kit. Pl. Hung.* i. 96. *t.* 93.

E. pilosa γ. *Roep. Enum. Euph.* 63. *Hook. Brit. Fl. l. c.*

Stem erect, biennial, with numerous leafy branches; *leaves* broadly lanceolate, oblong, generally blunt, very slightly serrate towards the point, hairy beneath, sometimes slightly so above; *umbel* irregular, of about five principal branches and numerous scattered inferior ones, trifid and then bifid; *bracteas* all elliptical, quite glabrous; *glands* of the *involucrum* transversely ovate; *fruit* covered with more or less prominent points, which are generally purple, and terminate usually in a long hair, sometimes glabrous; *seeds* obovate, minutely punctured, even. In *var.* β. the *leaves* are hairy, the *umbel* more regular, and the *fruit* smooth and glabrous.

α. Near Bath. β. Not yet found in Britain. ♃. May, June.

14. *Euphorbia coralloides.* Linn.

Umbellâ quinquefidâ trifidâ bifidâ, bracteis universalibus ovato-oblongis in ulterioribus ovatis omnibus villosis, glandulis involucri 4 subrotundis, foliis lato-lanceolatis apice tenuissimè serrulatis villosis, capsulis læviusculis lanatis, seminibus obovatis minutissimè punctatis et obsoletè reticulato-rugosis.

E. coralloides. *Linn. Herb.*; *Amœn. Acad.* 3. 123.; *Sp. Pl.* i. 659. *Willd. Sp. Pl.* ii. 916. *Roep. Enum. Euph.* 60. *Bluff. et Fingerh.* ii. 446.

E. pilosa. *Hook. Brit. Fl. ed.* 1. 382. (excl. syn. *Reichenb.*) *Lindl. Syn. ed.* 2. *p.* 329.?

E. pilosa α. *Hook. Brit. Fl. ed.* 3. 388.

Stem erect, annual, with few distant leafless branches, all bearing flowers; *leaves* broadly lanceolate, generally obtuse, very finely serrate, particularly towards their points, covered with longish white hairs on both sides; *umbel* consisting of 5 branches, which are trifid and then bifid; *general bracteas* ovate-oblong, the tertiary ones ovate, all hairy on both sides;

glands of the *involucrum* 4, transversely ovate; *fruit* nearly smooth, densely covered with woolly hairs; *seeds* obovate, minutely punctured, and, under a lens, covered with faint rugose reticulations.

Abundant at Slinfold, Sussex; naturalized? ♂. May, June.

15. *Habenaria chlorantha.*

Calcare ovario duplò longiore subclavato, labello lineari, integerrimo, petalis superioribus conniventibus obtusis, antherâ infernè duplò latiore truncatâ: loculis obliquè ascendentibus et apice convergentibus.

Orchis alba bifolia minor calcare oblongo. *Vaill. Paris.* 151. *t.* 30. *f.* 7.

O. alba calcari oblongo. *Raii Syn. ed.* 2. 238.

O. hermaphrodita bifolia. *Raii Syn. ed.* 3. 380.

O. *n.* 1285. *Hall. Hist. Plant.* ii. 146. *t.* 35. (good.)

O. bifolia. *Hall. Icon. Pl. Helv.* 40. *t.* 35. (good.) *DeCand. Fl. Fr.* iii. 245.; *Bot. Gall.* i. 446.

O. bifolia β. *Huds. Fl. Angl.* 333.

O. bifolia α. *Sm. Herb.*; *Fl. Brit.* iii. 918.; *Engl. Bot. t.* 22.; *Engl. Fl.* iv. 9. *Curt. Fl. Lond.* vi. 65.

Platanthera chlorantha. "*Reich. ap. Moessl.* ii. 1565. (anno 1828.)" *Reich. Icon. Bot. Cent.* ix. *t.* 853. *Lindl. Syn.* (*ed.* 2.) 330.; *Orchid.* iv. 285.

O. bifolia β. *Gaud. Fl. Helv.* v. 425.

O. virescens. *Zollik. ap. Gaud. Fl. Helv.* v. 497. (anno 1829.)

H. bifolia et chlorantha. *Hooker, Brit. Fl. ed.* 3. 376.

The description of this plant given by Sir J. E. Smith in his English Flora is so good as not to require any addition, except in that part which refers to the flower, to which I would add the following:

Upper lateral petals about ⅓rd longer than the anther, obtuse; *spur* about twice as long as the germen, thickened towards the end; *anther* very large, truncate, the bases of the cells being twice as far apart as their tops, giving to the whole anther a somewhat semicircular character, the central line between the cells in front elevated into a prominent keel and forming a furrow on the back; *stigma* very broad at its top and slightly pointed in the middle, curved into a semicircular form. *Flower*

sweet-scented in the evening, not scentless as described by many of the Continental authors.

The old figures of this genus are all so imperfect that I have thought it better not to notice them.

In woods and thickets frequent: rarely in pastures. ♃. May, June.

16. *H. bifolia.*

Calcare ovario duplò longiore subclavato, labello lineari integerrimo, petalis superioribus conniventibus obtusis, antherâ oblongâ truncatâ: loculis parallelis.

O. alba bifolia minor calcari oblongo. *Raii Syn. ed.* 2. 238.

Orchis bifolia. *Linn. Herb.*; *Sp. Pl.* 1331. *Huds. Fl. Angl.* 333. *Sw. in Sven. Bot.* v. *t.* 314. (good.)

O. bifolia β. *Sm. Herb.*; *Fl. Brit.* iii. 918.; *Engl. Fl.* iv. 9.

Pl. brachyglossa. *Reich. Icon. Cent.* ix. *t.* 852.

Pl. bifolia, *var.* brachyglossa. *Lindl. Syn.* (*ed* 2.) 330.; *Orchid.* 4. 285.

Much smaller than the last, and the *leaves* much more shining; *anther* truncate, often slightly emarginate, rarely a little rounded at the top, its cells nearly parallel and contiguous throughout their whole extent, their bases much less produced than in *H. chlorantha,* the central line between the cells a furrow in front a keel behind; *stigma* rather broad, truncate, folded so as to leave a channel between its pointed lobes, middle emarginate.

The only specimen of *O. bifolia* preserved in the Linnæan herbarium clearly belongs to this species.

Moushold Heath near Norwich. *Sir J. E. Smith.* Open part of Epping Forest. *Mr. E. Forster.* Treborth near Bangor, Caernarvonshire. *Mr. John Roberts.* Abundant in heathy parts of the Sussex forests. ♃. June.

17. *H. fornicata.*

"Petalis superioribus arrectis acuminatis, calcare ovarium plus duplum longo descendente, anthera oblonga fornicata," labello lineari integerrimo.

Pl. bifolia. *Reich. Icon. Cent.* ix. *p.* 19. *t.* 851. *Lindl. Syn. ed.* 2. 261.? ; *Orchid.* 4. 285. (excl. syn. Linn.)

I am only acquainted with this plant from the figure and description quoted above. It appears to be a truly distinct species, having its *anther* rounded at the top and hooded, the *cells* parallel; *stigma* apparently narrower than in *H. bifolia*; the *upper lateral petals* acute, not converging over the anther; the *lip* narrowing slightly from its base, and rather more acute than in either of the preceding species; *spur* very long, subulate. The whole plant is probably smaller than *H. bifolia.*

The Linnæan herbarium having proved that the *Pl. brachyglossa* of Reichenbach is the true *O. bifolia* of the *Sp. Pl.,* I have been obliged to give a new name to this species, and have chosen one derived from the structure of its anther. Reichenbach's description and figure are derived "ad vivam e Flora Dresdensi."

The quotation of Lindley's *Syn.* is probably correct, as he has altered his authority in the 2nd edition of that work, and now quotes Reich., not Linn. as he did in the first. I cannot, however, be certain, since he says, "anther with converging cells"; now they appear to me to be parallel. He also says, "in groves and thickets in England"; he would therefore appear to consider it common: but I have not, after the examination of numerous specimens of the so-called *H. bifolia* from various and distant parts of the country, been able to detect a single individual of this species. He also continues to quote *Engl. Bot.* i. 22. for this species as well as for *H. chlorantha.* He is, I believe, the first botanist who published the fact that two plants, distinguished on the Continent, but confounded by English authors, exist in this country.

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XXVII. *Observations on the Development of the Theca, and on the Sexes of Mosses.* By William Valentine, *Esq., F.L.S.*

Read May 7th and June 18th, 1833.

THERE is, perhaps, no part of the physiology of plants involved in deeper mystery, or about which there is a greater diversity of opinion, than the sexuality of Mosses. Of all the theories which have hitherto been presented to the notice of physiologists, that of the celebrated Hedwig has obtained by far the greater number of followers. He described two kinds of organs constituted, in his opinion, for the purpose of reproducing the species,—the male, or spermatocystidium, the female, or pistillum: the former being a pedunculated oblong sac, containing a fluid mixed with a granular pulp, which is discharged with some force from the sac on the application of water; the latter, after the admission of the *semen masculinum* by means of the stigma and tubular style, enlarging to form the fruit. All that has been hitherto known about this body is, to use the words of Professor Hooker (*Muscologia Britannica*, Introduction, ed. ii. p. 11.), that "the base of one of the pistils gradually swells more and more, and after a certain period the upper part of the style and stigma withers, but still remains. The germen is now seen, covered by a thin membrane, which, as the fructification advances, separates transversely at the bottom, and rising up with the more advanced germen, takes the name of calyptra, or veil. It is carried up by means of a pedicel, or fruitstalk, which now develops itself and reaches to a different height in different species, in some being five or six inches in length. When it has attained its utmost development, the mature germen becomes the perfect fruit, and is called the capsule." We find in this passage the opinion that the capsule, or theca as it is now more properly named, is formed in the first instance, and carried upwards by the subsequent development of the fruit-stalk or seta. There are generally several of these pistilla together; they are

often mixed with jointed pellucid filaments, "*fila succulenta*" of Hedwig, and in some cases accompanied by the supposed stamens, which in others grow on a different part of the same plant (monœcious), or on a distinct plant (diœcious). The object of this paper is chiefly to explain the anatomy of these pistilla, their structure being such as to throw considerable light upon the sexual theory. I was first led to examine this subject by discovering the highly curious fact, that the setæ of Mosses and the Jungermannias terminate downwards in a cone, which is inserted within a corresponding cavity of the branch, to which it has but a very slender attachment; or, in other words, that the seta has very little if any organic connexion with the plant. This structure appeared to be so anomalous, that I determined on the first opportunity to investigate the cause. The following observations are the result*.

In the very young state the pistillum contains a single unconnected oval transparent body or cell, which is situated about one third from the base. The pistillum, as yet, has not begun to enlarge, but is of one uniform diameter. The cell is present before the apex of the pistillum has burst open to form the stigma; and consequently before there is any communication, by means of the tubular style, with the external air. This canal, however, is formed before the bursting open of the apex, and leads directly down to the cell, which appears to be situated in its lower extremity. The cell may be distinguished through the walls of the pistillum with the assistance of a good Wollaston doublet, and I have succeeded in dissecting it out uninjured. It was of a firm texture, a quality depending probably on the thickness of the membrane; it was also beautifully pellucid, and contained a quantity of moving particles. Upon pressing it with a piece of talc it burst, and the moving particles escaped. Its diameter was between the one thousandth and the one five-thousandth of an inch. Generally one or two only of the pistilla in the same bud arrive at perfection, and the abortive ones are destitute of this cell; whilst, on the contrary, in *Bryum ligulatum* nearly all the pistilla, sometimes amounting to between twenty and thirty, become fruit, and in every one of them may the cell be detected. *Bryum roseum* very rarely

* Since this was written, I have been favoured by Mr. Brown with a sight of Hedwig's *Fundamentum Historiæ*, &c., in which this structure is figured. It is surprising that this remarkable peculiarity should not be anywhere noticed, either by Hooker, Greville, or, indeed, any of the British muscologists.

indeed produces fruit in this country; but in the winter it not uncommonly possesses healthy-looking pistilla. I have, however, never been able to detect the cell in any of them. The manner of the development of this body is exceedingly simple. Soon after the opening of the upper extremity of the style another cell is formed on the upper surface of the first. The two adhere firmly to each other, and may be dissected out together. Presently another cell is formed, either on the upper surface of the second, or on its side; then appears another, and so on gradually increasing in number. When about ten cells are developed the dissection becomes comparatively easy, and the oblong mass may be exposed, with the original cell still remaining at the base. In this stage it has become rather flattened on the upper surface from the pressure of the newly-formed cells.

Whilst this process is going on, the base of the pistillum itself increases in size, not by distention, as is universally supposed, but by the addition of fresh matter. At the same time the style becomes of a red or brown colour, of a rigid texture, and never increases in size after the opening of its canal. In *Funaria hygrometrica* the pistillum elongates considerably before the base has increased in diameter, to allow of the rapid growth of the oblong or fusiform mass within, which now occupies its whole length from the apex immediately beneath the hardened style to the very base, and even beyond, having pushed its conical extremity deeper into the tissue, until at last it has actually penetrated the branch itself. After the pistillum has attained a considerable length, its base increases in diameter without a corresponding increase of the central body, so that a space is left between the two. Very shortly the pistillum separates transversely below the dilated portion, and is supported on the apex of what may now be called the seta, by the more rapid elongation of which the separation has been caused. At this period may be observed a sheath of elastic gummy secretion, embracing the base of the seta, immediately opposite the point of separation between the upper part of the pistillum (now called the calyptra) and the base, which receives the name of vaginula. This sheath of mucous gradually becomes solid and cellular; and, by its connexion with the vaginula and its firm embrace of the seta, serves to secure the latter in its cavity.

The extremity of the seta is not invariably conical. The exceptions, how-

ever, appear to be few, as I have only detected three out of the very great number of species I have examined. In *Sphagnum* it is shaped somewhat like a button, having a very narrow neck, which is firmly embraced by the vaginula. This narrow neck is the only seta which exists in this genus, so that the theca is placed immediately on the vaginula. Muscologists, from not understanding the anatomy of this part of mosses, have denied the presence of a vaginula in the genus *Sphagnum*. Dr. Greville and Mr. Arnott, in their excellent memoir published in the Wernerian Transactions, have indeed maintained the existence of the vaginula; but they have described as such what ought not to be so considered. In this genus the calyptra, instead of dividing at the point where the sheath of mucus is secreted around the seta, is torn irregularly across the middle by the enlargement of the theca; and the scarious portion, which remains loose about the base of the theca, these observers have mistaken for the vaginula. The true vaginula, which is dilated and lentiform, to accommodate itself to the button-like termination of the seta, they call the receptacle, from not being aware of the internal structure. Another variety in the figure of the termination is in *Schistostega pennata,* where it is obovate, and the vaginula very much resembles in appearance the theca. But the most curious exception is in *Dicranum flexuosum*, in which the form is conical, but instead of being straight, is bent completely on itself. This structure can only take place by the second cell being developed on the under surface of the first instead of on the upper, as happens in all other cases. The succeeding cell is placed transversely, and the rest assume the normal direction.

To return to the progress of the development. A period of a month or more follows the separation of the calyptra without any further change taking place than the gradual elongation of the seta. In some instances, as *Encalypta vulgaris, Tortula ruralis,* and many more, three or four months are occupied by this process. The seta elongates by the addition of new matter *at the apex*, where it is always of a more delicate texture than nearer the base. The cells are also more crowded, less distinct in their outline, and have as yet no cavity. The further you examine from the apex, the more decidedly does the tissue become cellular, until it has arrived at maturity, when the cells are considerably elongated. After attaining a length, varying in each species

according to circumstances, the seta gradually enlarges in diameter at the apex, and imperceptibly assumes the form of the theca. A section of the dilated apex, if made at an early period, will exhibit a central portion and a cortical layer, only differing from the structure of the seta itself by being more distinctly defined. As the theca advances towards maturity, the cortical layer gradually recedes from the central axis, but is still connected with it by little transverse fibres, or rather strings of cells, which pass from one surface to the other without apparent arrangement. The axis, or columella as it is now termed, is supported on a pedicel which is continuous with the central tissue of the seta; whilst the outer layer, or true theca, is an expansion of the external layer of the seta. Surrounding the theca, near the apex, is a faint line, which indicates the situation of a transverse dehiscence to take place at the perfect maturity of the theca. The portion above this line varies considerably in figure, and is called the lid, or operculum. The ring or orifice of the theca, formed by the fall of the operculum, is called the mouth or stoma. It is necessary to name these parts in this stage of the development, to explain clearly the succeeding steps of the process.

The distance of the columella from the theca varies in each species; in many being but trifling, whilst in some it is considerable, as in *Gymnostomum pyriforme*. But in none is it so remarkable, so far as I have examined, as in *Bartramia pomiformis*. In this plant the columella is borne on a pedicel even longer than itself, and only occupies a small space in the upper and middle part of the theca. A section of the columella, in this stage, exhibits a trace of division into an external layer and a central axis. This external layer is gradually pushed outwards (until it comes in contact with the theca) by the formation of the sporules, between it and the axis to which the name columella is with greater strictness applied. The layer itself has received the name of internal or lining membrane of the theca; but as I have ascertained the presence of a distinct and very important lining membrane to that part, it will be more convenient to assign the name of columellar membrane to this, as to the columella it assuredly most naturally belongs. The cavity in which the sporules are developed is closed on all sides, being bounded at the centre by the columella, and at the circumference by the columellar membrane, which passes outward from the base of the columella to the theca, on

the inner surface of which it is reflected upwards to the stoma. The membrane is attached to the stoma all round, frequently by a distinct process; and after forming this attachment, it passes horizontally inwards, and becomes again continuous with the columella at its apex. Until about the period of maturity, or a little earlier, the columella is continuous from the base of the theca up to the arch of the operculum, when a transverse line (indicating a tendency to separation) appears above the point of its connexion with the columellar membrane. Most commonly this separation does actually take place, and the upper portion falls with the operculum. This portion was first described and named, very appropriately, by Greville and Arnott, the opercular membrane. I have observed in one instance, the *Hymenostomum* of Brown, the columella to separate below as well as above the point of connexion with the columellar membrane. The opercular membrane, when nature, either remains attached to the columella, falls with the operculum, or (in the genus *Polytrichum*) shrivels from below upwards, and remains attached to the apices of the teeth of the peristome in the form of a horizontal membrane or tympanum.

In an early stage the inner layer of the operculum separates in the form of a distinct membrane, which, ultimately dividing longitudinally into a definite number of processes or teeth, forms the peristome. In some rare instances this membrane never breaks up into teeth, as in *Diphyscium*; whilst in one instance, *Buxbaumia*, it is double; the external splitting into ciliæ, and the internal remaining entire. At the same time that this membrane is formed from the operculum, the opercular membrane forms another, immediately within the first, by a separation of its exterior series of cells. This also, more or less, divides longitudinally into a determinate number of teeth, thus forming the inner peristome. The number of teeth forming each of these peristomes has been ascertained by muscologists to be either four, or a multiple of that number*. The outer peristome is universally considered to arise from the theca itself; whilst the inner is believed to arise from the internal membrane,

* Mr. Brown appears to have been the first to point out the mode of ascertaining the true number of the teeth. This great botanist reduces the number of the outer series in most instances to thirty-two. Vide Linnean Transactions, vol. xii. p. 577., where may be found some excellent observations on this subject.

or columellar membrane of this paper. The necessity of substituting this name will presently appear. To say that the outer peristome *arises* from the theca would give an incorrect idea both of its origin and connexion. It is *continuous* at the base, with a delicate lining membrane, which is very intimately attached to the theca. The existence of this lining membrane, which has hitherto escaped the notice of observers, may be proved by taking a portion of the theca from which the columellar membrane has been detached, and carefully separating the peristome from above downwards, when the lining membrane will remain attached to the base. A very thin longitudinal section will also show the division of the theca itself into an external and internal layer. The former, when mature, is of a dense coriaceous or even horny texture; whilst the latter is of a loose spongy cellular tissue. The most favourable examples to prove this fact by dissection are found in the genus *Tortula*; but the Hypnums, a genus very remote from *Tortula*, are by no means unfavourable. The term lining or internal membrane ought properly to be applied to this newly described layer; but, to prevent confusion, it appears desirable to abandon the use of this name altogether, and to supply its place with the term columellar membrane, designating the proper lining of the theca the thecal membrane. The inner peristome is continuous with the columellar membrane, at the point where this last is attached to the inside of the stoma. These peristomes are not always formed. Some genera are altogether destitute of them, whilst others have only one, which, as far as my observations have gone, is always the external. Dr. Hooker, in the Linnean Transactions, vol. ix. p. 310, describes the single peristome of *Pterogonium declinatum*; and Bridel, the membranous ring of *Hymenostomum*, as arising from the columellar membrane. With regard to the first plant I cannot give any positive evidence; but it seems probable that Dr. Hooker was mistaken, from not being aware of the presence of a thecal membrane. This probability is strengthened by the facts that the peristome of *Pterogonium intricatum*, another species of the same genus, arises from the thecal membrane; and *Pterogonium gracile* has actually a double peristome. As to the origin of the peristome in *Hymenostomum* I can speak with greater certainty, as I have frequently dissected away the columellar membrane entire; and the peristome was in every case left attached to the thecal membrane. This latter peristome,

although it follows the law above stated, is very anomalous in other respects. It is a horizontal membranous ring, formed between the opercular membrane and the horizontal portion of the columellar membrane. This situation precludes the possibility of its having been formed by the separation of the internal layer of the operculum.

It is now necessary to describe the development of the sporules. The period at which this process commences is rather uncertain; most probably it begins at the time of the separation of the columellar membrane from the columella. Dr. Hooker in the *Flora Londinensis,* vol. iv. fasciculus i., under "*Diphyscium foliosum,*" has this passage: "It would be curious to ascertain, were it possible, what becomes of the substance forming the cellules in the early state; for the ripe seeds are quite free and unconnected, yet not separated by any membranous substance such as the walls of the cellules appear to have been formed of. On the contrary, they occupy a cavity around the columella, which appears evidently to be nothing more than the remains of the cellular and pulpy substances in which the seeds have not been perfected, and which, as we may consequently expect, when dry, shrinks up into an angular axis or columella, as it is called by Hedwig and other muscologists." Mr. Brown, in the Linnean Transactions, vol. x. p. 315, says, in speaking of what he names the placentation of the seeds: "That in some cases the seeds may be formed in a much greater portion of the columella than in others: and it is even not improbable that in certain cases its whole substance may be converted into seeds: or, to speak more accurately, that it may produce seeds even to the centre, and that the cells in which they were probably formed may be reabsorbed." From these passages it appears that their authors consider the seeds or sporules to be formed in the columella, and even of its very substance. Dr. Greville and Mr. Arnott, in their Memoir, object to the opinion that the columella, in the ripe theca, is merely a contraction of the debris of the sporular mass, from the regularity of figure which it often retains, and also from its being sometimes tubular; a fact which, they say, is irreconcileable with the notion of contraction. My observations have convinced me that the sporules are formed from a gummy fluid, which is secreted either by the columella or columellar membrane (most probably by both), and that this secretion becomes cellular by the gradual separation of

the fluid from the solid part; the separation taking place in numberless points throughout the whole mass of secretion. As the little particles of fluid increase in size, the solid material increases in density, until it has assumed the consistence of membrane, which forms an envelope for every separate particle of fluid. Each of these particles, with its investing membrane, then detaches itself from its neighbour and becomes an independent cell or sporule. The following are the facts which have induced me to form this opinion. I find upon puncturing the sporular sac of any Moss in the young state, that a quantity of gummy fluid escapes through the puncture. I find also, that the young sporules always adhere together in masses, if carefully taken out of their natural situation, apparently from being imbedded in an adhesive fluid. The structure of the sporules themselves favours the opinion. In the young state they are remarkably pellucid, and contain a quantity of particles, either in one mass or arranged in *three or four well-defined smaller masses.* These particles I have observed to move with great rapidity. (The species under examination was *Bartramia pomiformis.*) The formation of these particles takes place either during the formation of the cell or very soon afterwards. I have seen the cell in many instances destitute of particles, when, from its extreme transparency, it required a good lens to detect it. The sporule gradually assumes a dark brown colour, and when mature, becomes more or less opake. In some instances it becomes reticulated; in others, granulated on the surface. It is difficult to assign a perfectly satisfactory cause for these appearances. The reticulation, perhaps, depends on the increase in size of the particles within (some of them in the young state being much larger than others); whilst the granulated appearance seems to depend on the hardening and contraction of the membrane. That the sporules are not formed in the columella is clear, as I have frequently dissected off the columellar membrane; and after carefully washing away the sporules, could never detect any in the columella. In the genus *Polytrichum* there is a proof still more satisfactory. The columella, in this genus, has a further separation of its tissue into an axis and a *middle* membrane, between which, in the early state, there is a considerable space, traversed by horizontal fibres. The connexion which these fibres form between the divided surfaces is similar to that which has been already described as

existing between the thecal and columellar membranes. If the sporules were developed in the columella, we should find them occupying this space between the axis and middle membrane: but, on the contrary, they are invariably confined between the middle and columellar membranes.

It will be easy to prove that the sporules are not formed *of* the columella by a breaking up or separation of its tissue: the only foundation for which opinion is, that the columella, in some species, shrinks into so small a space as not easily to be detected; a fact readily accounted for when we consider that, in those instances in which the supposed separation takes place, the cells of the columella are remarkably large, and consequently formed of but little solid material; so that when the fluid (of which in the young state the cells are always full) is dried up, the tissue contracts to the bottom of the theca, and is there easily overlooked. I have examined the thecæ of several of the *Phascums,* in which genus the columella generally shrinks very remarkably; and I have always succeeded in stretching out the collapsed organ to its original dimensions. The columella of *Gymnostomum pyriforme,* in an old theca, occupies but a very small space compared with what it did when young. A section of this may easily be stretched to the full diameter, and then it becomes manifest there has been no dissolution of the tissue. The view here given is supported by the following considerations, which also show the probability that the cellular tissue, at least, of all plants is formed in this manner. We know that the elaborated juices of Dicotyledonous plants descend, between the bark and the wood, in the state of a thick viscid fluid called cambium: and we know that there the alburnum and liber are formed. If a delicate longitudinal section of the end of a growing Hyacinth root be made, we shall find, at the very extremity, a soft, thick, viscid fluid covered by the cuticle. A little nearer the bulb are a number of minute points: still nearer, these points are larger and more transparent: nearer still, they are of a considerable size and transparent, until, gradually, they assume the appearance of cellular tissue. There are no vessels in this part; they being gradually sent downwards from the bulb after the cellular tissue is formed.

Lastly, the sheath of viscid fluid, which, by becoming cellular, connects the seta with the vaginula, may be cited in corroboration. The cellules of

Bovista giganteum have been computed by Dr. Lindley, in his valuable Introduction to Botany, page 7, to increase at the rate of sixty-six millions in a minute. I cannot conceive any mode by which this astonishing rapidity of development can possibly occur, but by the rapid secretion of fluid material, which instantaneously separates at innumerable distinct points into its solid and aqueous constituents.

We have now, I flatter myself, obtained knowledge of the structure of the organs of reproduction sufficient to enter on the subject of the sexes. As the theory of Hedwig is the only one that has obtained any consideration, I shall confine my observations to that. In the Linnean Transactions, vol. x. p. 312, Mr. Brown says, "The account which the celebrated Hedwig has given of the sexes of Mosses seems to be founded on so ample an induction, and is now so generally received, that it must be unnecessary to notice the arguments which mere theoretical botanists have, from time to time, produced against it." Dr. Hooker observes on this subject, in a note to the second part of the *Flora Scotica*, "The more intimately we become acquainted with the reproductive organs of the *Acotyledonous* or *Cryptogamic* plants, the more apparent is it, in my opinion, that there are no sexes, as in the *Phænogamous* plants, no stamens and no pistillum, nor anything analogous to them; consequently no true *seed*, which can only be produced through their cooperation. The structure of the *seeds* themselves (more properly *sporules*) tends greatly to confirm such an opinion, there being, in reality, no distinction into *cotyledon*, *radicule* or *plumule*, in short, no embryo, any more than there is in the little bulbs seen upon the stalks of the Onion tribe, and upon the *Polygonum viviparum*, &c., which yet equally produce perfect plants. A *sporule* has alike the power of producing from every part of it, either stem or root, as circumstances may require: but it is quite otherwise with the true seed." Dr. Greville and Mr. Arnott in their Memoir remark, that "It is extremely improbable that Acotyledonous plants are furnished with stamens and pistils, and that through their agency the seeds or reproductive sporules are formed. This idea is corroborated by the common phenomenon which takes place in those Cotyledonous plants which rarely bring their seeds to maturity; small bulbs (*gemmæ*), analogous to the sporulæ of the *Cryptogamia*, are produced in the axillæ of the leaves, which, when they fall off, strike root at any part indiscriminately,

thus differing most essentially from true seeds, while the new plant which arises from them is equally perfect. This appears also to have been nearly the opinion that Dillenius entertained respecting the propagation of the *Musci*; and it has been confirmed in later times by the celebrated Richard and others."

In the same Memoir we have the following quotation from Sprengel: "'Though,' says this naturalist, 'I have formerly been a zealous advocate for Hedwig's theory of the fructification of Mosses, it has nevertheless appeared to me an insurmountable objection, that the supposed anthers can again produce buds and strike roots, which is certainly the case with regard to the disks of *Polytrichum commune, Bartramia fontana, Bryum palustre, undulatum, cuspidatum, punctatum,* and with those of *Tortula ruralis.* In *Bryum argenteum* we see the buds containing the supposed anthers constantly drop off, strike root, and produce new plants: this I have observed myself times out of number. Still more in point is the experiment first made by David Meese, of sowing the stellulæ of *Polytrichum commune,* containing merely club-shaped bodies, when he found that plants came up, which, in their turn, produced fruit. Another excellent naturalist, Dr. Roth, has made similar observations with regard to *Hypnum squarrosum* and *Bryum argenteum.*'" "He afterwards adds," say the authors of the Memoir, "'It is more probable, therefore, that these supposed anthers are mere *gemmæ,* produced by the superabundance of the juices, and hence surrounded by succulent filaments.'" The latter quotations contain, as far as I have been able to ascertain, the chief evidence against the theory of Hedwig. Although such arguments establish the improbability of the presence of sexes in Mosses, they by no means amount to a proof of their absence. As for the observations of Sprengel and Meese, they are very defective. Mr. Brown, in a conversation which took place about three years ago on this subject, very justly objected to the conclusions drawn from these experiments. From the statement of Sprengel, it does not appear that the supposed anthers were actually seen to grow: and it seems most probable that the growth took place in the axillæ of the scales, which formed the bud containing the anthers. Every one acquainted with vegetable physiology is aware of the great tendency to development existing in the axillæ of leaves, especially in those which form the scales of a bud. To have

made this experiment satisfactory, the supposed anthers should have been detached completely from the scales of the bud; or the growing bud should have been dissected, and the new parts have been traced distinctly to the anthers. The first experiment I have tried, but only in one instance. It did not corroborate the statement of Meese, although the subject of the experiment was the same species as that which he employed,—*Polytrichum commune.*

The most satisfactory refutation of the theory of Hedwig will be found in the anatomy of the pistillum, where the impregnation of the seeds is supposed by him to take place. It is strange that the structure of this organ should have been so long misunderstood; that the young theca, under the name of germen, should have been supposed to be concealed in the bosom of the pistillum; a supposition of which there is not the shadow of a proof. If we refer to the description in the first part of this paper, we shall find that the cavity of the pistillum is occupied, in the first instance, by a single cell; and that this cell always remains at the base of the seta, where it may be found to the very last, tipping the conical extremity. We also find that before one particle of the theca can be formed, the seta must be developed; a process which, in many instances, occupies two or three months after the destruction of the pistillum. It is scarcely necessary to ask, how it is possible that the sporules can be impregnated before the theca, in which they are developed, is in existence. If sexes are to be found in Mosses, they must be sought in the theca; and accordingly we find that various botanists, probably impressed with this idea, have named in succession all the different parts of this organ as performing the function of the anthers. Some have fixed on the columella; others on the peristome; others on the operculum. It is altogether unnecessary to enter on an examination of the truth of these various hypotheses, as their original proposers have adduced so little in their support, that no one at present considers them worth the slightest attention.

I beg leave to submit to the notice of physiologists the following view of the nature of the sporules. After a series of observations, I am led to believe that the sporules of Mosses, and I may add, of all cellular plants, are analogous to the pollen of the *Vasculares,* slightly modified by circumstances, but agreeing

in every essential particular. In support of an opinion so opposite to any hitherto proposed, I offer the following evidence*.

The analogy of the development of the sporules to that of pollen is very striking even to a superficial observer, and has not escaped the notice of botanists. A section of the anther of the common garden variety of *Primula vulgaris,* taken from a bud when about the size of a small pin's head, exhibits a structure which may be compared to a section of the theca of *Polytrichum.* In the former we find an axis of dense tissue (the connectivum) surrounded by the cuticle. This axis is not central, but placed nearer to the cuticle, on the back of the anther, and may be considered as the columella; whilst the cuticle will represent the theca. A separation of the tissue gradually takes place, in four distinct points, nearly at equal distances from the axis. As the axis is not centrical, these points lie towards the front of the anther. Between each of these points the cuticle is furrowed longitudinally, so that the section has somewhat of a quadrangular figure. The theca of *Polytrichum* merely differs from this in having a complete separation of its tissue all round the axis instead of in four points only. The spaces caused by the separation (not *dissolution*) of the tissue, gradually enlarging, form the cells of the anther, in which the viscid secretion takes place. This secretion is afterwards converted into pollen, in a manner similar to that in which the sporules are formed. When the anther is nearly ripe, a still further separation of the tissue takes place, and the four cells become two. When perfectly mature, these cells

* Since this paper was read, Mr. Brown has called my attention to a memoir by Professor Hugo Mohl (see *Flora,* No. 5, February 1833, p. 65, *et seqq.*), in which the same views are advanced and supported at considerable length.

I may also mention that on the second evening of the reading of this paper Professor Agardh of Lund, who happened to be present, informed me that he had maintained a similar view to the one above as to the nature of the sporules of the *Algæ,* in a work which he had published, but which had not found its way into this country. [The work here alluded to is probably the second volume of the *Lehrbuch der Botanik,* of which a German translation appeared at Greifswald in 1832.]

I am aware that Mons. Palisot de Beauvois endeavoured to prove that the sporules were pollen. He maintained that the sporules impregnated the seed (which he fancied he had discovered), like the pollen of Phænogamous plants;—a view the very opposite to the one proposed in this paper. Mr. Brown has long since (*Linn. Trans.* x. p. 314.) pointed out the error of M. de Beauvois.

dehisce longitudinally at the lateral furrows. In *Buxbaumia* the theca frequently dehisces longitudinally after the manner of some anthers; whilst in *Solanum* the anther dehisces by a pore at the apex, thus approaching the ordinary dehiscence of the theca. The lining of the cells, or *Endothecium* of Purkinje, may be considered analogous to the columellar membrane. In offering this view of the anther, it must not be understood that I dispute the accuracy of those beautiful laws of Morphology which are now so universally acknowledged. All I affirm is, that the tissue of the anther *separates* in a manner similar to that of the theca, without any reference to the *origin* of that tissue.

Similar as is the origin of the pollen and the sporules, their appearance is no less so. In the very young state, it is impossible to distinguish the slightest difference. They are round or triangular, &c., according to the particular species; they are pellucid, and they contain a few moving particles. As they grow older the moving particles increase in size and quantity; and the enveloping membrane becomes more opake. When the pollen has arrived at maturity, the application of water causes the membrane to burst, and the moving particles to be forcibly ejected. I have frequently observed the same fact in sporules of the Mosses and Jungermannias; and Mr. Brown has recorded a similar occurrence in the Lycopodiums. After describing the capsules, he says, in the *Prodromus Floræ Novæ Hollandiæ*, p. 20, "Semina? ovalia, in cumulo alba, seorsim semipellucida, in aquâ fovillam minutissimam explodentia!" It appears by the note of interrogation after "semina," that Mr. Brown, with his usual sagacity, perceived something of their real nature, although the subject did not receive any further attention.

The observations of modern botanists have thrown great light onh te function of the pollen; and from the observations of Amici and Adolphe Brongniart in particular, "It is now known," says Professor Lindley, Introduction to Botany, p. 264, "that a short time after the application of the pollen to the stigma, each grain of the former emits a tube of extreme tenuity, not exceeding the 1500dth or 2000dth of an inch in diameter, which pierces the conducting tissue of the stigma, and finds its way down to the region of the placenta, including within it the active molecules found in the grain: no one has actually seen the tubes pass further than the placenta; but there appears to be

good reason for supposing that the vivifying matter communicated by the pollen tubes to the placenta is by some unknown means transmitted by the latter to the foramen of the ovulum, through which it finally passes into the nucleus, there to become the new embryo*." It is a well established fact that the embryo, or essential part of the seed, is derived from the pollen, and that the membranes which are produced by the pistillum only act as a protection and channel of nutrition to the embryo, until such time as it shall be enabled to provide for itself. Mr. Drummond, in a paper published in the 13th volume of the Linnean Transactions, proved, beyond a doubt, that the sporules of Mosses germinate by emitting "pellucid filaments" from any points in their surface. I have myself examined the germinating sporules of *Funaria hygrometrica*; and I found that the brown coat burst sometimes in two or three places, but most frequently in one only; and there protruded from each fissure a delicate transparent tube containing the moving particles, which had previously occupied the cavity of the sporule. These tubes, or, to speak with more precision, elongated cells, gradually increased in length, and, from exposure to light, became of a green colour. They soon became jointed, from the addition of fresh cells at the extremities. They then began to branch, and after a time produced leaves.

The only difference that I can find between pollen and sporules is, that the coat of the latter is of a more rigid and opake texture. From this difference it is that the sporules rarely burst in a sudden manner upon the application of water; but when they do, the moving particles are discharged loose in the water, precisely in the same manner as are those of the pollen. In both sporules and pollen it is necessary, to the production of the tubes, that the laceration of the coats should take place slowly.

Without reference to the evidence here adduced, we do not overstep the bounds of probability in supposing that in plants of a complicated organization there exists a necessity that the embryo should be protected by a nidus capable of imparting aliment until it shall become sufficiently organized to be capable of reproducing a plant equal in complexity of structure to its parent. Whilst in the *Cellulares* the process of their growth is so little complicated

* Mr. Brown has actually traced the pollen tubes into the foramen of the ovulum in *Orchis Morio, Habenaria viridis* and *Ophrys apifera*. See Linnean Transactions, vol. xvi. p. 742.

that the embryo requires no preparation to enable it to perform its functions.

But, taking into full consideration the facts above narrated, we cannot but conclude that in the *Cellulares*, a provision similar to that of the pistillum in *Vasculares*, does not exist,—the former being capable of reproduction by the mere ejection of its pollen or sporules on the soil.

Professor Lindley has drawn an ingenious analogy between the parts of fructification in Mosses, and the flower of *Vasculares*. He argues, that the peristome and calyptra are modified leaves, obeying the received laws of morphology. Not having an opportunity of examining the proofs, which he draws from examples in the cotyledonous plants, I cannot enter on this subject with any chance of either disproving or confirming his opinions. I can, however, bear testimony to the opinion that the calyptra is a modified leaf. Any one who had seen the young leaves of *Tortula ruralis* growing amongst the pistilla would be struck with the similarity of their appearance. If the small portion of lamina at the base of the excurrent nerve were folded inwards, and united at the margin, it would be almost impossible to distinguish the leaf from the calyptra. Dr. Greville, in his beautiful Scottish Cryptogamic Flora, has unintentionally given a good proof of this fact. His figure of the calyptra of *Leskea polyantha* has two nerves at the base, opposite the fissure, precisely similar to those which are found at the base of all the leaves in the plant.

Since this paper was read to the Society, I have been informed by Mr. Brown that Dr. Mohl has recently published some "Observations on the Development and Structure of the Sporæ of Cryptogamous Plants;" a translation of that part which relates to the Mosses he has most kindly furnished me with. Dr. Mohl describes the cavity between the columella and columellar membrane as being occupied, in an early state, by an extremely delicate cellular tissue, the cells of which lie in horizontal rows, and contain small granular masses, the rudiments of the future sporæ. In most Mosses, he states, the sporæ are four in each mother cell, and they are arranged in a tetrahedral union. He fancied that, in some of the cells, he discovered more than four

sporæ, but, from their very small size, he could not obtain a positive conviction of the fact. According to my own observations, these "mother cells" are the true sporæ, and the bodies which he considers the sporæ are the granular contents, arranged in three or four distinct masses, as I have before described. Dr. Mohl also advocates the propriety of considering the internal membrane as belonging rather to the columella than as forming a lining membrane to the theca, which coincides with the view I have offered of its nature.

EXPLANATION OF TAB. XXIII.

Fig. 1. A very young "pistillum" of *Orthotrichum anomalum* before the bursting open of the tubular style at the apex. The solitary cell is seen at the bottom of the canal.

Fig. 2. A "pistillum" more advanced; the base having begun to enlarge, the apex of the style open, and the second cell formed.

Fig. 3. The pair of cells from the last fig. dissected out.

Figg. 4. & 5. Cells dissected out from more advanced "pistilla."

Fig. 6. Another very young "pistillum" of *Orthotrichum Lyellii*, showing more clearly than fig. 1. the tube passing down to the cell.

Fig. 7. Two primary cells of *Tortula ruralis* dissected out, and one of which is burst open to show the moving particles.

Fig. 8. A section of the tubular style of *Orthotrichum affine.*

Fig. 9. The pistillum of *Orthotrichum Lyellii*, a little before the separation of the upper part to form the calyptra. The style is decayed. The longitudinal folds are nearly peculiar to the species.

Fig. 10. A section of the last. The young seta is in the centre, showing a division or arrangement of the tissue into the axis and cortical layer. The wall of the pistillum has separated from the seta and become plicated. That the pistillum does not enlarge at the base by distention (from the growth of the supposed germen within) is evident, as there is a considerable space between the two.

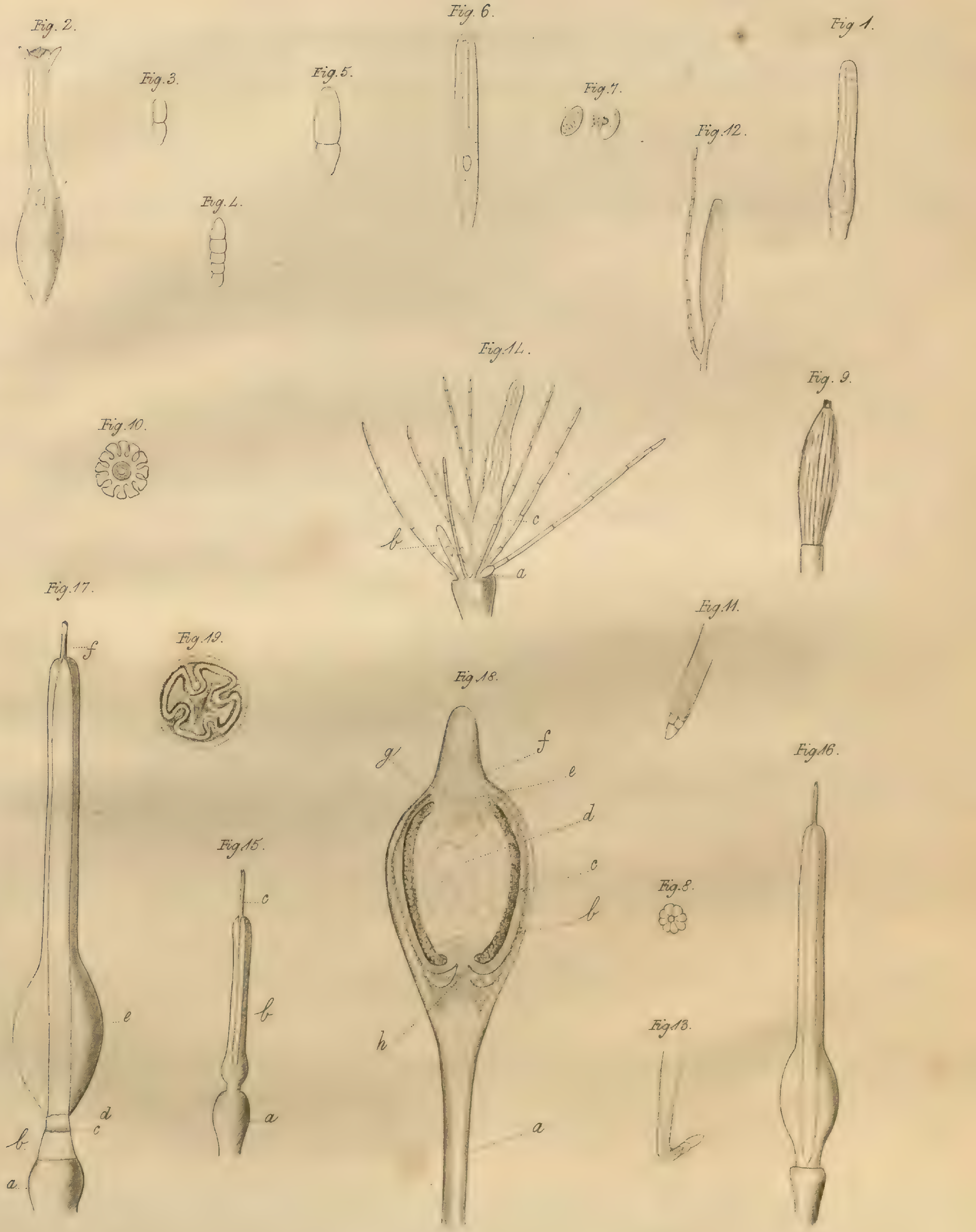
Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
Fig. 6.
Fig. 7.
Fig. 8.
Fig. 9.
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Fig. 11.
Fig. 12.
Fig. 13.
Fig. 14.
Fig. 15.
Fig. 16.
Fig. 17.
Fig. 18.
Fig. 19.

H. Weddell sc.

Fig. 11. The seta of the two preceding figures, dissected out, to show the original cell still tipping the conical extremity.

Fig. 12. An anther of *Orthotrichum anomalum*, with a jointed filament arising from its base.

Fig. 13. The conical extremity of the seta of *Dicranum flexuosum* dissected from the vaginula. When confined by the vaginula the extremity is closely pressed to the seta.

Fig. 14. A bud of *Funaria hygrometrica*, containing three "pistilla" in various stages of maturity, and surrounded by jointed filaments, or "fila succulenta" of Hedwig. *a.* A pistillum just protruding from the apex of the stem. *b.* A pistillum more advanced, with its cell. *c.* A pistillum still more advanced.

Fig. 15. A more advanced pistillum from the same plant. *a.* The apex of the stem. *b.* The base of the pistillum much elongated by the growth of the seta within, and slightly enlarged at the base. *c.* The style hardened. This and the two following figures are not nearly so much magnified as the first.

Fig. 16. The same, still more advanced.

Fig. 17. The same, just after the separation of the pistillum to form the calyptra. *a.* The apex of the stem. *b.* The vaginula formed by the base of the pistillum. *c.* The sheath of elastic gummy secretion exposed by the separation of the calyptra. This sheath is internal to the calyptra, and serves to fix the seta in the vaginula. *d.* The seta. *e.* The calyptra just separated. *f.* The hardened style.

In these last figures the conical extremity of the seta is shown gradually forcing its way downwards.

Fig. 18. A section of the theca of *Gymnostomum pyriforme*, a little before arrived at maturity. *a.* The seta. *b.* The theca lined by the thecal membrane. *c.* Columellar membrane. *d.* Columella. The dark mass between the columella and columellar membrane is the sporules. *e.* Opercular membrane. *f.* Operculum. *g.* Point where the columellar is attached all round to the theca. A little above this point the dehiscence of the operculum will take place. *h.* The pedicel of the columella.

Fig. 19. A section of the ripe theca of *Polytrichum aloides,* showing the 4 longitudinal inflexions of the columellar membrane and the quadrangular columella. The columella resembles a Maltese cross, and has an axis of dense tissue. The empty space between the columella and columellar membrane is occupied by the sporules.

XXVIII. *On the Nervous System of Molluscous Animals.* *By* Robert Garner, *Esq., F.L.S.*

Read November 4th, and December 16th, 1834.

Though in this paper the author originally included the nervous system of the *Radiata*, yet he now, upon more mature consideration, determines to confine his observations to Molluscous animals, convinced that he can add little of importance to the recent labours of the German anatomists* in this department, who have shown the errors of their predecessors, and themselves discovered the true nervous system of Radiated animals.

In the *Tunicata* the nervous system consists of a ganglion and nerves (Tab. XXIV. fig. 1. A, *a*, *b*.), generally very visible on slitting the cartilaginous covering. In *Phallusia intestinalis*, Sav., we discover this single, yellowish ganglion, lying upon the muscular coat between its two orifices. In other species we see the ganglion nearly divided. One set (*a*.) of filaments surround the branchial orifice, and give nerves to its tentacula, and appear to meet on the opposite side, forming in the *Phallusia* a nerve which seems to run along the edge of the elongated branchial fold. The other set (*b*.) supply the muscular tunic, and also the mantle, and go towards the mouth. In *Cynthia*, and those *Tunicata*, which have thick muscular tunics, the ganglion is not visible external to the muscular sac, it being situated in its interior. The above-described ganglion is, according to Cuvier, analogous to the posterior or branchial ganglion of *Conchifera*. In the figure are shown two minute bodies (G.) seen on the intestine of *Phallusia*, which Meckel suspects may be ganglia, but which as probably may be traces of a second ovary.

* More particularly Tiedemann and Ehrenberg. Spix appears to have been mistaken in his account of the ganglia and nerves of the *Actinia*, as he certainly was in that of the nervous system of the *Asterias*. The author's observations agree with those of Leuchart, Rapp, and Meckel in this respect. The nerves of *Radiata* are exceedingly minute and difficult to discover; in preparations the vessels are often shown for them.

In the *Tunicata* are no lips, no foot, nor valvular muscles, and therefore the ganglia which supply those parts in *Conchifera* are absent. Their single ganglion evidently presides over the functions by which the water, &c. is drawn in and expelled.

The only correct description of the nerves of a Bivalve animal is that given by Mangili of the nerves of the *Anodonta*. In all Bivalves, with the exception of those entirely destitute of a foot, we find three ganglia, each of which is composed of two others. In *Ostrea*, which has no trace of a foot, there is no inferior or pedal ganglion, but only a few scattered filaments in its situation. The posterior ganglion is always situated at the posterior muscle between the branchiæ. That it is chiefly a branchial ganglion is proved by its being regulated in its disposition by the situation of those organs. Thus in *Ostrea, Cardium, Unio, Anomia, Venus, Pholas, Teredo, Solen, Mya, Mactra,* &c., in which the branchiæ are united together, the two ganglia which compose it form but one. But in *Mytilus, Modiola, Pecten,* &c., in which the branchiæ are separated, and at a distance from each other, the two ganglia are more or less separated, always, however, united by a transverse chord. This ganglion (Tab. XXIV. fig. 2, 3, 4, 5, 6 & 7, A.) gives off anteriorly two nerves (*a.*), by which it is joined to the anterior or labial ganglia (B.). Besides these, the posterior ganglion gives nerves to the branchiæ (*b.*), large branches to the respiratory siphons (*c.*), minute visceral filaments (*d.*) to the posterior parts of the viscera (the labial ganglia sometimes giving a filament or two to the anterior parts), twigs (*e.*) to the posterior muscle, and branches to the mantle (*f.*). These ganglia and nerves are much developed in *Conchifera,* which, like the *Pholas,* have their branchiæ and siphons large. The anterior or labial ganglia (B.) are never in conjunction, but always united by a transverse filament (*g.*), which arches over the mouth. In *Mytilus* and *Modiola* they are of a lengthened form, and situated a little behind the mouth. In the *Pectines* they are much more posterior. In *Mactra,* however, they have advanced forwards, and nearly meet over the mouth; and perhaps these *Conchifera* show more locomotive activity than any others. Besides the nerves which they receive posteriorly, and the connecting filament between the two, each gives off one or two nerves (*h.*) to the mantle, tentacular branches (*i.*), and muscular filaments (*j.*). Each ganglion likewise sends down a nerve (*k.*), which meets its fellow, and

forms a ganglion (C.) in the substance of the foot, giving many branches to this organ. This ganglion in Bivalves is never divided: that it chiefly belongs to the foot, and not to the viscera, is proved by its being regulated in size by the development of the foot, and being absent when that organ has disappeared. The author could never trace any filaments from it to the viscera. It is large in *Solen*, *Mactra*, *Unio*, &c., small in *Pecten*, *Mya* and *Anomia*, and absent in *Ostrea*. It is generally, as in *Mactra*, situated between the muscular tissue and the viscera; more forwards in *Cardium echinatum*; in *Pecten* at the anterior part of the base; in *Pholas* superficially at the point.

In *Conchifera* then the mouth is surrounded by a ring, of which the lower part is double. This ring is, however, very wide, other organs besides the mouth being within it. Generally the nervous system is symmetrical; but when the animal, as *Ostrea*, is inequivalve, the nerves going to the branchiæ and mantle in the deeper valve are lengthened and disarranged. In *Anomia* the anterior ganglia are displaced, and the inferior become lateral, from the change in the position of the mantle and foot. The ganglia of *Conchifera* are of an orange colour; in those, however, of which the tissues are transparent, they are whiter.

The anterior and posterior ganglia are figured by Poli in many Bivalves; in no instance has he described the inferior one. It is well known that he considered these nerves to be lacteals, and the ganglia receptacula chyli, from the possibility of injecting their sheaths.

That the anterior ganglia are the cerebral or sentient lobes of the animal appears from this, that the other pairs communicate with them, and not with each other. The separate ganglia of each pair are conjoined that their action may be consentaneous. The pedal, from its supplying the foot, may be correctly termed the ganglion of locomotion; whilst the posterior, supplying the branchiæ and siphons, may be termed respiratory: but as each pair supplies likewise other parts, their functions cannot be purely so limited, though it is probable that the subordinate function is derived from twigs they receive from the others, incorporated in the connecting nerves. The anterior ganglia in the *Pecten* (fig. 5, B.) are seen to be composed of two portions, one coloured and soft, the other fibrous, composed of filaments passing through the ganglia.

In *Pecten, Spondylus* and *Ostrea* we find small, brilliant, emerald-like ocelli, which, from their structure, having each a minute nerve, a pupil, a pigmentum, a striated body, and a lens, and from their situation at the edge of the mantle, where alone such organs could be useful, and also placed, as in *Gasteropoda,* with the tentacles, must be organs of vision.

The *Gasteropoda* offering much variety in form, present likewise corresponding differences in the nervous system; for in all animals the disposition of the latter is chiefly determined by the shape of the body; keeping it, however, in mind, that as we ascend, we find an inclination in the several ganglia to become concentrated and ascend towards the head. With the exception of the *Tunicata,* we find in all *Mollusca* the centre of the nervous system to be a ring around the commencement of the digestive tube, more narrowly embracing it as we get higher in the orders of animals. Its exact situation varies with circumstances; thus it will be found around the very commencement of the alimentary canal, close to the lips, in *Helix*; in *Eolida* behind the muscular pharynx; some distance down the œsophagus in *Buccinum*; whilst in one species of *Purpura* it is generally behind the stomach. In these latter animals it is fixed itself, but the œsophagus has free motion through it, as the proboscis is more or less protruded.

The nervous system of *Patella* (Tab. XXV. fig. 3.) shows, on the one hand, the resemblance of this system in the *Gasteropoda* to that of the *Conchifera*; and on the other to that of the *Cephalopoda.* We have the cerebral or sentient ganglia (A, A.) at the base of the tentacles and eyes, which are here present, supplying principally those organs, and receiving a filament (*b.*) on each side from the pedal ganglion (B.), and another (*a.*) from the branchial ganglion (C.), as in *Conchifera.* The ganglia of both these pairs are connected that their action may be combined, the connecting filament of the branchial passing in its course through the two pedal ganglia. The pedal ganglion supplies the foot, the branchial or respiratory ganglion the branchiæ and mantle, also giving lesser filaments (*f.*) to the viscera, and others (*e.*) to the shell muscles. That this last is a branchial ganglion is proved by this: the author has observed that in *Fissurella* (an animal differing from *Patella* in having the branchiæ removed to the back of the neck, and in which animal Cuvier notices the deficiency of the two external ganglia,) they exist, but in a dif-

ferent position, but where one might expect to find them, at the base of the branchiæ on the back. Perhaps we might infer from Cuvier's description that the nervous system in *Haliotis* is similarly disposed. In *Lottia*, which has a single branchial appendage over the neck, and a branchial circle besides around the mantle, the ganglia are unaltered in their position. Besides eyes, we have in *Gasteropoda* another important part more than we find in *Conchifera*, the pharynx or manducatory apparatus at the commencement of the œsophagus, consisting of a muscular cavity, with a curious spiniferous tongue at its floor, often supported by two or more cartilages, and sometimes furnished with one or two horny maxillæ. Either a transverse band or two ganglia supply this complicated apparatus with nerves, this band, or these ganglia being always subœsophageal, forming another ring around the digestive canal. In *Patella* this band (D.) is connected with two ganglia (E.), which supply the fleshy lip of the animal, and not with the cerebral ganglia. Thus the second part of the digestive canal has its ganglion connected with those supplying the nerves of the entrance, and through them with the brain; the functions of the parts appearing thus naturally combined. The *Patella* appears to be the only Gasteropodous animal where these labial ganglia exist separate from the superior or cerebral ganglia. In the *Cephalopoda*, however, there are distinct labial and pharyngeal ganglia, the latter, as in *Patella*, only connected to the superior ganglion through the former. These pharyngeal ganglia, besides supplying the pharynx, give origin to superior visceral or sympathetic nerves (*k, l,*), very fine and delicate, ascending and descending on the œsophagus and getting upon the salivary ducts and glands.

In *Chiton* (fig. 1. & 2.), there being no eyes nor tentacles, the upper portion of the ring has no evident ganglia. The branchial (C.) and pedal ganglia (B.) are sometimes distinct, sometimes conjoined on the inferior portion of the ring. The pharyngeal ganglia are also developed on the ring.

In *Scyllæa* (fig. 4.), an animal not covered, like *Patella* and *Chiton*, with hard, insensible, testaceous parts, but with a delicate and sensible dorsal integument, bearing also the branchiæ (the muscular foot having almost disappeared), we find the brain entirely supraœsophageal from the change above mentioned. It appears composed of four united ganglia (A.), probably the cerebral and branchial, which latter might be appropriately named

branchio-visceral. The foot has become too insignificant to require appropriate ganglia. Though there are in this animal, and in some species of *Doris*, no eyes, the author thinks he has found the rudiment of them in two minute black spots which he has noticed, one on each side the brain; and he infers that so unusual a circumstance must arise from the pigmentum nigrum existing on the brain before the external eye is developed. These spots mark the superior ganglia to be the cerebral, and we find the tentacles supplied from them. Externally the nerves are derived which supply the mantle, branchiæ, and viscera. In *Doris* and *Eolida* (fig. 5.) the same conformation exists. According to Cuvier the four ganglia are quite separate in *Tritonia*; and it would appear, from the observations of the same anatomist, that the nervous system of the genera *Phyllidia, Onchidium, Tethys, Testacella* and *Pleurobranchus* is more or less upon the same plan. The pharyngeal ganglia are often small, but exist as usual.

The nervous system of the *Aplysia*, which is not figured in the plates accompanying this paper because it is so minutely described by Cuvier, is particularly interesting. The cerebral or sentient ganglia, giving origin as usual to filaments forming the pharyngeal ganglia, are conjoined, as in other naked *Gasteropoda*, into one situated above the œsophagus. The two lateral ganglia give off internal filaments to the foot, and external ones to the mantle. It will be seen, as we ascend, that there are separate ganglia for the foot, mantle and branchiæ. In the *Aplysia* there is, besides, another ganglion,—the one supplying the branchiæ and visceral organs at the posterior part of the body. That each of the lateral ganglia is in reality composed of two, appears from its supplying the two parts above mentioned, which, in most of the *Gasteropoda* and in the *Cephalopoda*, have separate ganglia for each: besides, the fellow ganglia are connected together by two separate filaments, and between them the aorta passes, which in many of the higher *Gasteropoda* and in the *Cephalopoda* distinguishes by its course that part of the ring which supplies the foot from that which supplies the mantle and viscera. Lastly, each lateral ganglion is connected to the sentient lobe by three nerves, being those which it receives from the pedal and from the branchial ganglia, and from that of the mantle.

In *Bullæa* (fig. 9.) we find the pedal ganglia (B.) distinct from the two sup-

plying the mantle (C.). The branchial ganglion (H.), situated as in *Aplysia*, does not send its filament (*f.*) as a distinct nerve up to the brain, but it passes through the ganglion supplying the mantle. The two cerebral ganglia (A.) are here lateral. The pedal ganglia are connected both with the sentient lobes, and with those supplying the mantle, as will be found generally the case. A subœsophageal nerve completes the ring, and combines the pairs of ganglia; and the cerebral ganglia as usual give the nerves forming the pharyngeal ganglia.

The spiral *Gasteropoda* present considerable variety in their nervous system. It may be premised that in them we shall (with a few exceptions, where we only find two,) observe four nerves originating from the superior lobes, when the ganglia of the ring remain far separate, but from the posterior part of the inferior expanded portion of the ring in the higher *Gasteropoda*. The two external ones are the nerves of the mantle, analogous to those we shall see in the *Sepia* (and it is to be remembered that the mantle is an important part in respiration): the two internal ones are analogous to the branchio-visceral ones of the same animal. The branchiæ are sometimes supplied by one, sometimes by the other, and sometimes by both; but in the higher *Gasteropoda* entirely by the latter, as in *Cephalopoda*; and we shall therefore call the internal pair, arising from the posterior point of the inferior portion of the brain in the higher *Gasteropoda*, the branchio-visceral when the animal is aquatic, or pneumogastric when terrestrial. From these latter, filaments go to the viscera, and often form a ganglion at or near the stomach. The nerves of the mantle originate external to the preceding, and sometimes wholly or in part supply the branchiæ. From the shape of the spiral *Gasteropoda* these are more or less twisted in their course. They may be well termed external respiratory, as they supply the mantle, siphons, and roof and floor of the respiratory sac, and often the branchiæ more or less. The shell-muscles partly receive their nerves from one of these pairs, partly from the pedal ganglion.

The nervous system of *Ianthina* (fig. 7.) is one of the most simple of those of the spiral *Gasteropoda*. In it we have a lateral ganglion (A.) on each side, considerably removed from each other, giving origin to the nerves of the eyes and tentacles (*g.*) and lips (*i.*), and posteriorly each ganglion sends off three

filaments, one to complete the ring (*b.*), on the lower part of which two separate locomotive ganglia (B.) are formed; and two others on each side, one (*f.*) of which attains the visceral organs, meeting the filaments from the pharyngeal ganglia, and not in this case forming a visceral ganglion or plexus, the other pair being the nerves of the mantle (*o.*) and muscular cavity in which the branchiæ are found. The right one of these last crosses over the œsophagus, and forms a ganglion (H.) in the left side, the left one here not crossing under the digestive canal, as, however, it often does: the direction being reversed in sinistral shells. In the first case the right branchial appendage has mounted over the body of the animal, and is the one most developed; the corresponding nerve having accompanied it, and been developed into a ganglion. This is not the posterior ganglion of bivalves, that having become incorporated in the lateral ganglia of the brain.

In *Paludina* (fig. 6.) we see better the two lateral ganglia (A.) to be composed each of two others, and each portion is united to the pedal ganglion (B.) by a separate chord, the posterior chord being shown by analogy to be the nerve connecting the two ganglia, which are united to the cerebral, in consent with each other. The right is largest, giving nerves to the penis (*r.*) from near the optic. These ganglia supply as usual the eyes, tentacles and mouth; the pedal gives nerves to the foot (*d.*) and shell-muscles (*e.*). Two large nerves (*c.*) go from the superior ganglia to supply the mantle, branchiæ, viscera, and in part the shell-muscles.

In *Turbo* (fig. 8.) we have also the two sentient ganglia (A.) at a distance from each other, each composed of two others sending down two twigs (*b.*) to the pedal ganglion (B.). From the anterior part of the lateral ganglia the nerves of the eyes and tentacles (*g.*) and mouth are as usual derived. From the posterior part we have the branchio-visceral nerves, forming a small ganglion at the back of the branchial sac of the animal supplying the branchiæ and viscera,—and two external respiratory nerves (*o.*), each forming a ganglion (H.) in the flank, supplying the mantle, and in part the branchiæ, also the shell-muscles, as well as the lateral appendages, often developed in this genus. There are also a few filaments (*p.*) to the floor of the branchial sac and side of the animal. With the pharyngeal ganglia (D.), which it is needless any further to describe from their uniformity, there are

in this little animal eleven ganglia. The genus *Trochus* appears similar in its nervous system, as does *Cyclostoma**.

In *Neritina* (fig. 10 & 11.) we find the two branchial and pedal ganglia of *Patella* become quite united into a transverse oval mass (O.), which, therefore, as well as the foot, also supplies the nerves we have just seen going from the superior compound ganglia. The two connecting filaments remain distinct as they were in *Patella.*

The *Planorbis* (Tab. XXVI. fig. 7 & 8.) has a nervous system rather remarkable, as the animal itself is in other respects, being organized to respire both air and water. There is a branchial cavity with a wide anterior opening as usual, containing a long branchial appendage; a small opening leads out of this cavity into the pulmonary cavity. Near this opening is the rudiment of the other branchial appendage. Two filaments connect the separate lateral superior ganglia (A.) with the inferior part of the ring, where the four ganglia with their connecting nerves form a quadrangle. The branchial cavity would appear to be supplied from the two posterior ganglia of these. A filament from the right side mounts over the œsophagus, joining one from the left, and together they form a ganglion supplying the pulmonary cavity situated to the left. Some filaments (*e.*) likewise from the posterior part of the quadrangle and from the ganglion just described, supply the shell-muscles, and form a small ganglion (G.), supplying the branchial appendage and viscera.

In *Carocolla* (Tab. XXV. fig. 12.), *Helix, Limax, Partula, Achatina,* and *Bulimus* (fig. 13.) the author finds little difference in the form of the nervous system. The brain when cut across over the œsophagus appears of a diamond form, a branch of the aorta dividing the anterior pedal portion below from the posterior part. From the anterior part below arise the numerous nerves of the foot (*d.*), others for the shell-muscles, and a few (*p.*) for the flanks of the animal: from the posterior portion in the centre proceed the visceral nerves (*f.*), often forming a sympathetic ganglion (G.) on the stomach, and sometimes another in the right side, which appears rather to belong to the generative organs than to the mantle: the posterior portion also gives origin, a little without the last, to the nerves of the mantle, which here do not cross. The

* Berkeley, Zool. Journ.

pharyngeal ganglia (D.) send down distinct filaments to the salivary ducts and towards the ganglion on the stomach; the retractor muscles of the pharynx being supplied with nerves (*g.*) from a point close to those which arise to form them (in these animals midway between the superior and inferior portions). We shall see in *Cephalopoda* that the pharyngeal ganglia through the labial receive a filament both from the superior and inferior portions of the ring; and in *Gasteropoda* it may often also be noticed that a filament runs back from the labial nerves (*i.*) to the nerve forming the pharyngeal ganglia. The nerves of the eye, tentacles and lips are given off, as usual, on each side superiorly, the part where they arise being sometimes more or less swollen into a ganglion on the ring.

In *Natica* (TAB. XXVI. fig. 6.), *Buccinum* (fig. 1, 2 & 3.), *Purpura* (fig. 10.), *Murex, Mitra* (fig. 11.), *Columbella** (fig. 12.), and *Oliva* (fig. 4 & 5.), all spiral, branchiferous, and carnivorous *Gasteropoda*, the nervous system is very similar in all. The brain is still principally subœsophageal, and it presents much resemblance to that of the *Sepia*. From the posterior part the branchio-visceral nerves (*f.*) arise, generally forming a ganglion or plexus (*g.*) at the back of the thoracic cavity, near the second stomach. The right nerve of the mantle (*c.*) crosses over the œsophagus, a ganglion (H.) being formed on it, near the brain, in *Buccinum* and *Purpura*. This nerve, and its fellow, which does not cross under the œsophagus, supply the margin of the branchial cavity and siphon. In *Natica* the right goes to the left over the œsophagus, and the left under it to the right, both forming a ganglion (H.). From the anterior part of the inferior portion the nerves of the foot (*d.*) are derived; also in part those of the retractor muscle of the animal into its shell: a few filaments (*h.*) arise on each side this part to the sides and integument of the neck. The nerves of the lips (*i.*), eyes, and tentacles (*g.*) arise as usual; the former in part supply the muscles of the proboscis, the other nerves supplying the organ more anteriorly, being from the pharyngeal nerve. The pharyngeal ganglia (D.) in *Purpura* and *Buccinum* are close to the brain, the nerves proceeding from them being very long, to allow of the extension of the proboscis; in *Natica* they are situated as usual on the pharynx, and are con-

* The author takes the liberty of introducing figures of *Mitra* and *Columbella*, though not bearing upon the subject of the paper, because he believes the animals have not been described.

nected by long nerves to the brain. In *Buccinum,* the two pharyngeal ganglia can be seen to have a root both from the superior and from the inferior portions of the brain. The penis in the male receives twigs (*r.*) from the cerebral portion near the optic.

The author need not add his testimony to that of Stiebel, Müller and Blainville as to the real dioptrical structure of the eyes of these animals, and consequently to their being real visual organs, and not (as has been argued by Home) organs of ordinary sensation. No acoustic organ has ever been shown to exist, though it appears probable from experiment that there are such, and that they might be discovered in large foreign species of *Gasteropoda.*

The author can only refer the reader for the description of the nervous system in the *Pteropoda* and *Heteropoda,* to the works of Cuvier and Poli; but he may observe, that in both these divisions it appears to be scarcely as perfect as that of some of the lower *Gasteropoda,* to which it offers most resemblance, being far below that of the *Cephalopoda.*

The nervous system of the *Cephalopoda,* on one side very similar to that of the *Gasteropoda,* approaches on the other that of some fishes. It may also be mentioned that the cartilaginous parts or skeleton offers a greater resemblance to the skeleton of a fish than has been supposed. In the *Sepia,* for instance, (excluding the shell of the back from our consideration,) we see a large cerebral cartilage surrounding the brain, supporting the eyes, and presenting a number of foramina for the passage of nerves and vessels. There are other cartilages dependent upon this, two articulated with each orbital process, and another at the base of the anterior feet. There are five lengthened cartilages, of which one is anterior to the liver, two lateral, descending from the cartilaginous disk at the back of the neck, and two others, external to the last, at the base of the fins. These, according to Cuvier, are a rudiment of a spine. In *Loligo* there is some appearance of this spinal rudiment being articulated; and it may be mentioned that the vertebræ of some fishes are more or less anchylosed. The structure of the fins offers considerable resemblance to that of those organs in cartilaginous fishes, in the skate, for instance. The muscular fibres are regularly interspersed by long slender cartilaginous laminæ, arising from a ridge on the longitudinal cartilage. There are other cartilaginous parts, which may be rudiments of shoulder-bones, if

the long cartilages mentioned above are not such, instead of spinal cartilages.

The brain of the *Sepia* (Tab. XXVII. fig. 2 & 3.) consists of several parts or ganglia conjoined into a ring around the œsophagus, (from which it is only separated by a sort of dura mater,) and enveloped by the large cerebral cartilage. Superiorly, upon the œsophagus, we find the ring expanded into a lobe (fig. 2 & 3, A.), cordate in shape, and giving in front four nerves (*a.*) to the labial ganglia (E.), and two bands (*b.*) descending to the anterior part (B.) of the lower division of the brain. The optic nerves (*c.*) arise from each side of this lobe, and then swell into two large ganglia (F.), which subdivide into numerous filaments, piercing the coats of the eye, and forming the retina. This lobe is also continuous with the posterior part (C.) of the inferior portion of the ring by the broad band (*c′.*). The anterior part of the inferior portion gives its nerves to the feet, as it does in the *Gasteropoda* to the undivided locomotive foot of those animals. The anterior and posterior parts are connected together, but not quite so intimately as they are in some *Gasteropoda*. The anterior part, besides the pedal nerves (*d.*), sends a band (*e.*) to the labial ganglion, as we saw it did in the *Buccinum* to the ganglia, which in that animal gave off both the labial and pharyngeal branches. Here the labial and pharyngeal ganglia (D.) are distinct; the latter being connected to the former by two nervous bands (fig. 1, 2 & 3, *f.*), as we saw in *Patella*. The posterior part of the inferior portion gives off the two branchio-visceral nerves (*g.*); more outwardly the nerves of the mantle (*h.*), the great agent in drawing in the water to the branchiæ of the animal; more outwardly still, nerves (*i.*) which mount over the superior lobe and supply the retractor muscles: it also, in the *Sepia*, gives off here the two nerves which supply the respiratory valves. The nerves going to the mantle are distinct from those which supply the siphon or funnel (*j.*), nuchal valve (*k.*), &c. There are three nerves for the siphon, and two for the lateral valves. The aorta separates the part affording the branchio-visceral nerves, &c. from the more anterior half of this part, giving siphonic nerves*.

* The siphon is the expellent tube giving exit to the disaërated water, to the ink, fæces, and secretions. In respiration the *Cephalopoda*, with an inhaurient sac, and a valve in their siphon or funnel to prevent the entry of the water by the wrong opening, and also valves at the sides of the neck, and base of the siphon, to hinder its escape by the wide opening for its entry; having likewise protuberances on the inner surface of the sac, exactly fitting acetabula at the base of the siphon, for the

However, in other *Cephalopoda*, *Loligo* and *Octopus*, for instance, the two parts are not so distinct. In the midst of the nerves, which may be justly called the external nerves of respiration, arise the two acoustic nerves (*l.*); thus, as in vertebrated animals, connected at their origin with the nerves distributed to the respiratory tubes. The posterior portion is united to the anterior pedal portion, more or less intimately, in different genera. The aorta passes between them. The nerves supplying the external organs of generation do not arise from the brain, as in *Gasteropoda*, from their widely different situation. The pharyngeal ganglion (D.), quadrangular in *Sepia*, bilobed, as in *Gasteropoda*, in *Loligo*, is situated in its usual place, at the base of the tongue. Besides muscular and glandular branches (*m.*), it evidently sends down filaments (*n.*) upon the œsophagus. The labial ganglion, which gives two nerves to the pharyngeal, is large and round; it sends fifteen or twenty filaments (*o.*) to the lips situated around the maxillæ. As described above, it receives a nerve from the upper (sensitive), and another from the lower (motor) portion of the circle. A filament runs across from it, over the upper surface of the superior lobe, towards a round tubercle of nervous matter (*r.*), situated upon the optic nerve*. The upper surface of the superior cerebral lobe presents a division into an anterior and a posterior bilobed portion. As described above, it communicates by two chords on each side with the two divisions of the lower portion of the ring, the anterior band being in connexion with the band connecting the labial and pedal ganglia. The anterior division and band are larger in *Octopus* from the immense size of the feet†. The nervous

purpose of preventing any disarrangement of the parts; and, lastly, a funnel or siphon, through which the current is evacuated, conveying away the excretions, without their gaining access to and injuring the viscera: with such an apparatus these animals can have no need of vibratile cilia, so common in *Mollusca*; and the author has convinced himself that they want them, by examining the excised gills of the adult, and also the living animal of the *Sepiola* and *Sepia* just escaped from the ovum. We see the use of so many respiratory nerves from the complication of these organs.

* This little body has been figured in the *Sepia* by Mr. Owen (*Anat. of the Pearly Nautilus*). It equally exists in *Loligo* and *Sepiola*.

† The *Octopus* creeps, as well as swims, by means of its feet; and these are the most general locomotive organs in these animals. Some, however, as *Sepiola*, swim, by means of the contraction of the sac, in repeated jerks, the head being posterior, using the fins merely as rudders. The *Sepia* swims entirely by means of these latter organs, and consequently uninterruptedly; commonly the head is posterior, but when it descends, it does so head foremost.

circle then is double inferiorly, as we saw so low in the scale as in *Conchifera*, and the anterior division supplies, as in them, the organs of locomotion, and the posterior, the branchiæ, &c. In conjunction with the siphonic nerves arises on each side a nerve (*y.*), which pierces the cranium and enters the orbit, supplying two small muscles of the eye, of which one unites with its fellow of the opposite organ, and the conjoined tendon slides backwards and forwards in a pulley on the anterior and superior part of the cartilage. The branchio-visceral nerves descend on each side of the vena cava, giving many nerves, and amongst others, many filaments (*t.*) to the œsophagus, joining those from the pharyngeal ganglia. It divides behind the rectum, a branch going outwards to the base of the gill (*u.*), forming there an oblong ganglion (F.), and supplying that organ, &c.; minute filaments go to the pericardium and heart; the remaining branches get upon the œsophagus (o'.), and with those previously described, form a large ganglion (G.), in the *Sepia* a quarter of an inch in its long diameter, upon the stomach, between the cardiac and pyloric orifices. From this sympathetic ganglion filaments of a large size go to the cæcum (*v.*), intestine, ink-duct, penis and oviduct (*w.*), meeting filaments from the branchio-visceral. The nerve of the mantle gives a few nerves to the muscles, pierces the pillars supporting the head, divides into two branches, of which one forms the great ganglion (H.) of the mantle, from which nerves radiate in every direction to that part. The other continues to descend, receiving a large nerve from the ganglion, and then gets behind the large longitudinal cartilage, supporting the fin, where it subdivides, supplying that organ with large nerves (*z.*). Before it has pierced the muscle this nerve gives off fine filaments, which, running along the hepatic artery, get upon the œsophagus, and mix with its other filaments derived from other sources.

All the *Cephalopoda**, perhaps, have acoustic vestibules, containing a bag of fluid on which the nerve ramifies; also a small calcareous body, which in the *Sepia* has an accidental resemblance to the human incus.

In the eye there is a nervous coat or retina behind the pigmentum nigrum; and it has been a problem how it could be affected by light. The author is

* Not, however, according to Mr. Owen, in the *Nautilus*. The author has not seen them in the *Sepiola*, where the cranium is membranous; but probably it has been concealed, from its small size, in the latter.

convinced, however, that there is a retina internal to this pigment. By dropping dilute nitric acid on its internal surface, after removing the hyaloid, this retina is made apparent. It immediately becomes white and opake, and is seen to be of considerable thickness, but, like the black coat itself, of the greatest softness and delicacy. It must, however, be confessed that no nerves are seen to go from the external retina to this; but their fineness may conceal them. The glandular mass at the bottom of the eye communicates externally by means of a duct which pierces the cartilage, deepening the edge of the orbit, and is seen to open externally beneath and behind the eye*. The external opening does not, as is supposed, admit the rays of light to the lens. In the living animal it is perfectly closed, and it ought to be considered as the excretory orifice of an anterior chamber. There is a round transparent part of the conjunctiva for the admittance of the light. The orifice is not in the axis of the lens; it is so small, that it is often difficult to discover; and it does not, in the living animal, prevent the existence of an aqueous humour before the lens†.

There are trifling differences in the nervous system of these *Cephalopoda*. Thus in *Loligo* the pedal ganglion is very anterior, whilst in *Octopus* it is scarcely separate from the rest of the brain. When there is no fin, as in the latter animal, the second division of the large nerves of the mantle is wanting. The author has not had an opportunity of examining *Octopus*, so that he cannot positively affirm that Cuvier has overlooked the labial, lingual‡, and sympathetic ganglia, but he may mention that he has seen them in *Sepia*, *Sepiola*, and in *Loligo communis* and *medius*.

The author needs only notice Mr. Owen's beautiful "Monograph" to observe that the brain of the tetrabranchiate *Cephalopoda* must, from his description, be little different from that of the *Sepia*, though less perfect. The superior cerebral lobe is not developed; and in this and other respects it is more nearly allied to the brain of the higher *Gasteropoda*.

* The opening described by Blainville in the *Loligo* is probably the conjunctival pupil of Cuvier.

† There is much confusion and difference in the descriptions of Cuvier, Blainville, and Carus.

‡ This lingual or pharyngeal ganglion, however, though not described in the text, appears represented by his engraver without any mark of reference being attached. The author finds no mention of these different parts in Scarpa, Tilesius, or Swammerdam.

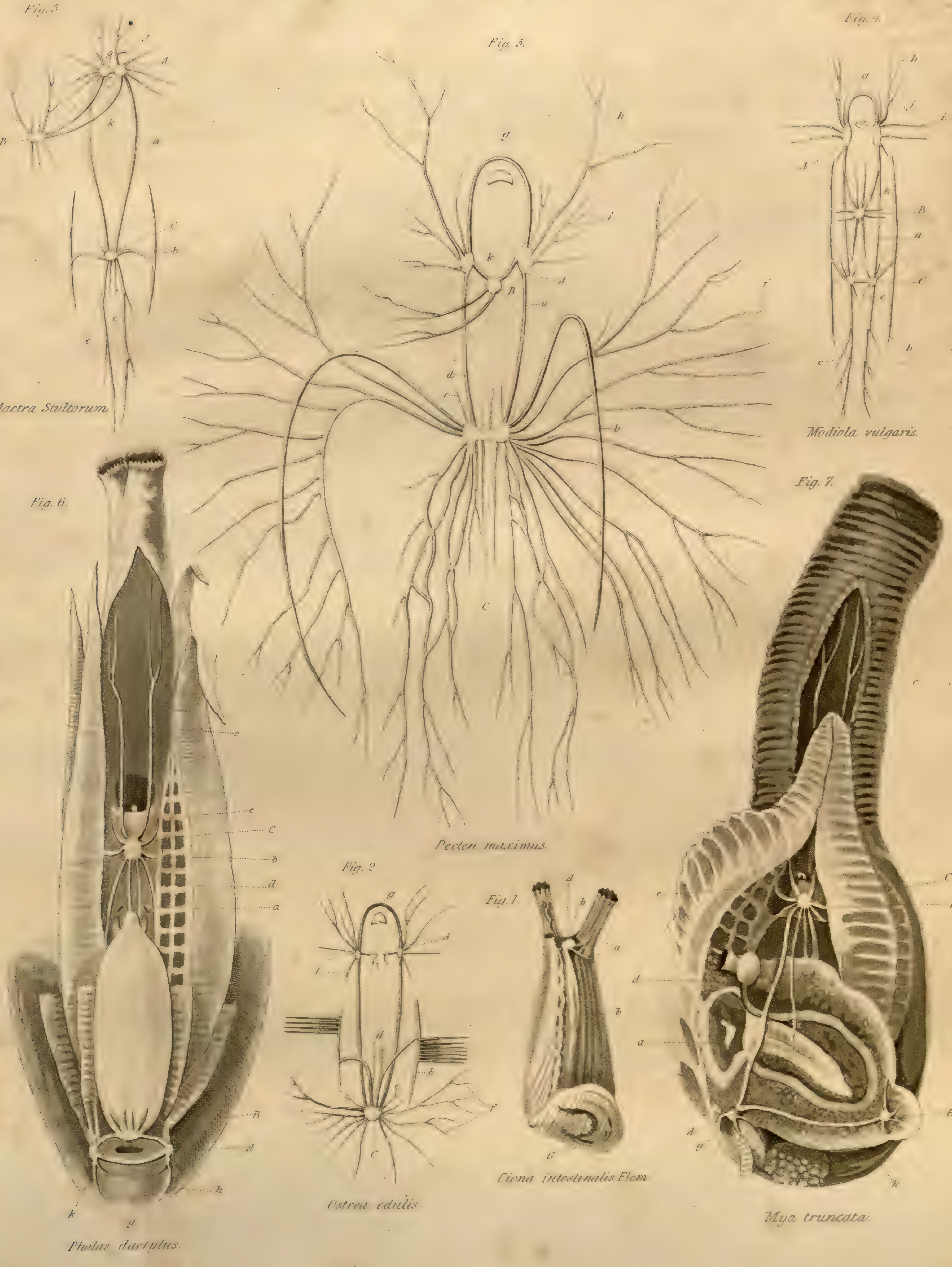
The nervous system of the *Cephalopoda*, then, has some resemblance to that of a fish. In one circumstance it differs from those of all vertebrate animals, viz. the brain has not yet entirely ascended over the œsophagus, but forms a ring around it. Without any stretch of fancy, the superior lobe may be compared to the optic lobes of a fish, or the corpora quadrigemina; and the anterior unlobed part of this ganglion is, perhaps, a rudiment of the hemispheres. But hence olfactory nerves ought to arise, as optic nerves do from the optic lobes, and form olfactory nerves. The nerves going hence form in fact a ganglion, which the author has called labial, but which gives a great number of nerves to two membranous parts around the maxillæ, the external one of which appears analogous to a membrane, which, in the *Nautilus,* Mr. Owen tells us, is of a structure identical with the olfactory laminæ of fishes, and to which he actually gives the name of olfactory organ. There is no rudiment of a cerebellum, which organ is, however, sometimes in a rudimentary state in reptiles. As we see in fishes large lobes developed on the olfactory nerves, we here see them on the optic. The eyes are as highly developed as those of many vertebrated animals, and hence the size of these lobes: to what parts of fishes, however, are they, and the little geniculata upon them, analogous? The pharyngeal ganglion and nerves supplying the jaws, tongue, maxillæ, salivary glands, muscles of deglutition, and forming the principal attachment or origin superiorly to the sympathetic, must be analogous to the ganglionic fifth nerve of higher animals. Its nerves of connexion are probably from two sources, two of those going from the anterior part of the superior lobe belonging to it, as well as the band of motor nerves from the pedal ganglion, going to it through the labial or olfactory ganglion; the fifth nerves here, as in other animals, being connected with the olfactory. The lower part of the cerebral circle evidently (with the exception of the pedal ganglion) gives off the same nerves as the medulla oblongata does in higher animals,—the external respiratory, acoustic, and branchio-visceral nerves. It receives from below two large columns, the position of which is similar to that of a spiral chord. External to these large nerves or columns is a large ganglion, which is connected to it by two separate bands: this ganglion gives its branches to the mantle, whilst the rest of the branches given by the nerve are distributed to the fin; all these nerves passing to their destination between cartilages, per-

haps bearing a resemblance to a spine. These two distant fasciæ offer but a poor resemblance to the spinal chord of many fishes: but in reality some of them, as *Lophius, Tetraodon* and *Petromyzon,* appear (from the description of authors*) to have that organ scarcely better developed; and a disjoined state is shown to be the normal condition of this organ in its first stage of development.

In concluding this paper, the author is conscious how much must be dry and uninteresting to many. As, however, he believes there are some new facts in it which may assist future inquirers, who may endeavour to show there is some meaning and method in these parts, and as he thinks he has proved the opposite to what another author† on the nervous system affirms of these organs in the Mollusca, viz. that they ought in every respect to be considered below those of insects, he will conclude by claiming the indulgence to which the difficulty of the subject entitles him.

* Des Moulins, *Système Nerveux.* Arsaky, *De Piscium Cerebro.*

† Serres, *Anat. Comp. du Cerveau.*



Garner, fecit. Zeitter, sculp.t

Fig 1
Chiton fascicularis.
Fig 2
Chit. marmoratus
Fig 3
Patella vulgaris
Scyllæa pelagica
Fig 5.
Eolida papillosa
Fig 6
Paludina vivipara
Fig 7
Janthina fragilis
Fig 8
Turbo littoreus
Fig 9
Bullæa aperta
Fig 11
Neritina canalis.
Fig 12
Fig 13
Bulimus hæmastomus

Garner fecit. Zeitter. sculp.t

Sepia officinalis.

XXIX. *Descriptions of Indian* Gentianeæ. *By* David Don, *Esq., Libr. L.S., Prof. Bot. King's Coll. Lond.*

Read November 3rd and 17th, 1835.

Among the numerous families which compose the class of Dicotyledonous plants there is, perhaps, none so equally and generally distributed over the surface of the globe as the *Gentianeæ*, for they are found dispersed throughout the greater part of both hemispheres; and this observation applies not to the entire family only, but likewise to many of the smaller groups, as may be seen by consulting the table which precedes the descriptive part of this paper.

In comparing the Floras of different countries, we shall find that what has been just stated with respect to their equal distribution is fully borne out by facts, at least in the Northern hemisphere, whose vegetable riches have been more completely investigated, and that they form about the proportion of $\frac{1}{90}$th of the phænogamous vegetation. In the Swiss Flora, which comprises 2000 phænogamous plants, 26 are of this family; in the Siberian Flora, of 1700 phænogamous plants, 21 are *Gentianeæ*; in that of the Caucasus and Crimea, in 2000 there are 20; in Peru and Quito, the phænogamous plants of which may be estimated at 4500, there are 43 *Gentianeæ*; and in the North American Flora there are 55 out of 4081 phænogamous plants.

By the indefatigable researches of Dr. Wallich and Dr. Royle, the number of species of this family belonging to the Indian Flora has been more than doubled, and they now amount to about 50. Of the 14 genera into which they have been distributed, *Canscora, Exacum, Slevogtia, Crawfurdia, Ophelia*, and *Agathotes* are exclusively Indian, and the remaining 7 are common also to the European and Northern Asiatic Floras. Of these 50 species, 34 belong to the Alpine Flora, which in 3500, the number at which the phænogamous plants of the Flora of Northern India may be estimated, will give a larger proportion than that above mentioned.

Although the *Gentianeæ* undoubtedly constitute a very natural family, agreeing remarkably in their habit and structure, and also in their sensible properties, they afford very few absolute marks to distinguish them from the other families to which they are related. When taken in an extended sense, the *Gentianeæ* may be said to hold an intermediate station between *Apocyneæ* and *Rubiaceæ*, differing from the former, to which they are more intimately allied, in the larger quantity of albumen, and in the much greater development of their embryo; from the latter in their free ovarium, and from both by their persistent corolla, and in the nervation of their leaves. We may compare *Crawfurdia* with *Gelsemium*, of which it possesses the twining habit and most of the characters, but the latter is essentially distinguished by its penninerved leaves, deciduous corolla, and concrete carpels, which unite it to *Apocyneæ*. Some species of *Lisianthus* resemble *Allamanda* in their woody stem and in the structure of their flower, and the twisted æstivation of *Apocyneæ* occurs also in *Erythræa* and *Gentiana contorta*. There is an evident affinity between the Rubiaceous genus *Oldenlandia* and *Mitrasacme*, which also accords in many respects with *Spigelia* and *Mitreola*, but it differs in the imbricate æstivation of its corolla. Seeing, however, the near approach to the valvate form of æstivation in *Slevogtia*, and that *Spigelia* and *Mitreola* agree with *Gentianeæ* in habit, I am led to question the propriety of considering them in any other light than as forming a subordinate group of that family. The genus *Canscora*, by its irregular flowers, and by its resemblance in habit to certain *Gratioleæ*, especially to *Torenia*, would seem to establish a relationship between the *Scrophularineæ* and this family.

The essential characters of *Gentianeæ* consist in their persistent usually plicate corolla; in the two carpels composing the pericarpium being placed right and left with respect to the axis of the flower; and lastly, in the nervation of their leaves, which bears a considerable resemblance to that of Monocotyledonous plants. These characters only apply to the normal *Gentianeæ*, and necessarily exclude the three small groups of *Spigeliaceæ*, *Loganiaceæ*, and *Potaliaceæ*, which Dr. von Martius has proposed to separate from them. In all these, however, the relation of the carpels to the axis of the flower is the same as in *Gentianeæ*, but they have all a deciduous corolla, and in the last two the leaves are penninerved. Another group, the *Menyantheæ*, consisting of

Menyanthes and *Villarsia*, has been recently separated from *Gentianeæ* on account of their alternate lobed or crenated leaves, characters which appear to arise from the peculiar circumstances under which the plants live, and perhaps of as little importance as the entire absence of those organs in the parasitical genera *Vohiria* and *Leiphaimos*; and the arrangement of the leaves is of less importance, since they are alternate in two species of *Swertia*.

I had formerly proposed (Edinb. Phil. Journ., July 1831, p. 275,) to refer the remarkable genus *Desfontainia** to the *Gentianeæ*, but from the circumstance of its possessing a multilocular ovarium, deciduous corolla, with imbricate æstivation, undivided stigma, opposite, spinously toothed, penninerved leaves, it is evident that the view which I then took of its affinities was erroneous; and I think it not improbable that it will be found to be more nearly related to *Ericaceæ* than to any other family. In my description I have described the berry as unilocular, with 4 or 5 parietal placentæ, but I now find that it has the cells complete, and is therefore multilocular. The structure and position of the anthers are very different from that of *Ericaceæ*, and bring the genus nearer to *Gentianeæ*; but I am inclined to regard it as the type of a group, alike distinct from these families as well as from *Solaneæ*, with which it has also been associated.

I have confined myself in this paper to the description of the species collected by Dr. Royle, who has liberally placed in my hands that portion of his herbarium for this purpose, and some of the more remarkable species will be found represented in his interesting work on the Botany of the Himalayan Mountains. In the arrangement of the species I have adopted some of the divisions of the Linnæan genus *Gentiana*, first suggested by Renealmus, and

* My learned friend Sir William Jackson Hooker, in the first number of his interesting and useful work, "*Icones Plantarum*," has published a figure of what I have long considered to be a third species of this genus, and which was first collected by my excellent friend Captain Phillip Parker King, R.N., in the Straits of Magellan and in the archipelago of Chiloë, and for which I beg to propose the following name and character:

D. fulgens, foliis cuneato-oblongis dentato-spinosis glabris subtùs glaucis: dentibus divaricatis, segmentis calycinis oblongis ciliatis, corollâ calyce 5-plò longiore.

Desfontainia spinosa. *Hook. Ic. Plant. t.* 33. haud *aliorum*.

The three species, although nearly related, are nevertheless essentially different in their leaves, calyx, and in the proportions of their corolla.

since adopted and confirmed by Borckhausen, Schmidt and others. I am aware much difference of opinion exists with respect to the multiplication of genera, but in the present instance, as the species will be found grouped much more naturally than in any method hitherto pursued in general systematic works, those who object to them as genera will see the advantage of adopting them as sections. Considering the many regions, especially in the southern hemisphere, that are yet but partially explored, it is not intended that the accompanying table should be taken as a complete view of the geographical distribution of this family, but only as exhibiting an approximation to one hereafter to be filled up by the discoveries of future travellers. The names of several genera occur in that table, which are not recorded in any of the systematic works yet published: for an account of these I beg to refer to the fourth volume of my brother's "General System of Gardening and Botany." I ought to notice, that some errors have crept into that account in transcribing from my notes, and from the circumstance of my not having had an opportunity of seeing the proof-sheets; but most of these errors will be found corrected in the present memoir. I am now disposed to refer *Selatium* and *Eudoxia* to *Gentiana*, and to consider them as forming two sections of that genus than as groups of a higher value, and *Ulostoma fimbriatum* may be regarded as constituting a section of *Gentianella*, only differing in the whole of the inside of the tube of the corolla being clothed with filamentous appendages. The *Selatium multicaule* appears to connect *Selatium* and *Gentiana*. The genus *Glyphospermum* is remarkable on account of its ligneous stem and its apparently monœcious flowers.

TABLE *showing the Geographical Distribution of the Normal Gentianeæ.*

	N. of Europe.	Central Europe.	S. of Europe.	Caucasus.	Siberia.	Kamtschatka.	N. India.	Central and South India.	China.	Japan.	Java.	Van Diemen's Land.	New Zealand.	Arabia.	Abyssinia.	Cape of Good Hope.	Madagascar.	Canary Islands.	United States and Canada.	California.	Mexico.	West Indies.	New Granada.	Peru and Quito.	Guiana.	Brazil.	Chile.	Straits of Magellan.	Total No.
1. Gentiana	1	...	...	1	1	2?	3	...	...	...	...	1	2	...	...	...	...	...	2?	...	...	...	1	15	...	...	...	1	30
2. Coilantha	...	7	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	10
3. Pneumonanthe	...	2	...	2	3	...	3	...	...	...	...	...	...	...	...	...	...	...	6	...	1	...	...	...	...	...	...	...	17
4. Ericala	1	10	2	...	6	...	7	...	1	1	1	...	...	...	...	...	...	...	4	...	1	...	...	1	...	...	...	...	35
5. Eurythalia	1	7	...	1	2	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	15
6. Selatium	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	...	...	...	...	8
7. Eudoxia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	..	2
8. Gentianella	2	1	...	1	1	1?	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	7
9. Ulostoma	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
10. Asterias	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
11. Frasera	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1
12. Swertia	...	1	...	...	1	1?	5	...	...	...	1?	...	...	1?	...	...	...	...	2?	...	...	...	...	...	...	...	...	...	12
13. Agathotes	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
14. Halenia	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	4	...	2	3	...	...	...	...	12
15. Ophelia	...	...	...	...	...	...	5	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
16. Pleurogyna	1	1	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	4
17. Glyphospermum	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	..	2
18. Centaurella	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	3
19. Schultesia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	2	...	...	4
20. Callopisma	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	2
21. Tachia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	..	1	...	...	...	4
22. Prepusa	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
23. Chlora	...	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
24. Hippion	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1
25. Canscora	...	...	...	...	...	...	3	5	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	8
26. Vohiria	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	4	...	...	...	6
27. Leiphaimos	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1
28. Enicostema	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
29. Crawfurdia	...	...	...	...	...	...	2	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
30. Coutoubea	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	1	...	...	3	1	...	..	5
31. Slevogtia	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
32. Schubleria	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	5	...	...	6
33. Helia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	2
34. Chironia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	...	...	...	...	...	...	...	...	...	...	...	...	11
35. Roslinia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1
36. Erythræa	...	6	15	...	1	...	1	...	1	...	...	1	...	...	1	...	...	...	...	1	...	...	...	1	...	...	1	...	29
37. Sabbatia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	10
38. Lisianthus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	2	3	4	4	11	8	...	...	35
39. Irlbachia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
40. Symbolanthus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	2
41. Eustoma	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	2
42. Sebæa	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	8	...	...	...	...	...	...	...	1	...	...	...	...	10
43. Exacum	...	...	...	...	...	...	2	10	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14
44. Microcale	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	3

3 U 2

Species common to Northern and Central Europe	10
Ditto ditto Western Europe and Caucasus	9
	19

Northern Hemisphere	240
Southern Hemisphere	97
Total number of Species	337

Intertropical	144
Extratropical	193
Total number of Species	337

Gen. I. GENTIANA. *Borck., Brown.*

Calyx 4—5-fidus. *Corolla* campanulata v. infundibuliformis, limbo 4—5-fida: *sinubus* non productis. *Antheræ* liberæ. *Stigma* sessile, bilobum. *Capsula* 1-locularis. *Semina* parietalia, immarginata, lævia.

Herbæ (per orbem ferè ubique sparsæ) *annuæ v. perennes, floribus subsolitariis aut corymbosis.*

1. *G. contorta,* annua; floribus solitariis, corollâ infundibuliformi 4-lobâ: lobis lineari-oblongis obtusis æstivatione convolutis, dentibus calycinis lanceolatis acuminatis, foliis ellipticis obtusis 5-nerviis subsessilibus.

Gentiana contorta. *Royle Ill. p.* 278. *t.* 69. *f.* 3.

Habitat in Emodi montibus ad Mussooree. *Royle.* ☉. Fl. tempore pluviarum.

Radix fibrosa. *Caulis* erectus, ramosus, teres, purpurascens, 5-pollicaris. *Folia* opposita, subsessilia, elliptica, obtusa, 5-nervia, glaberrima, subtùs pallidiora, pollicaria, basi angustata. *Flores* terminales, solitarii, brevissimè pedunculati, ebracteati. *Calyx* turbinato-tubulosus, 4-fidus: *laciniis* lanceolatis, acuminatis, erectis, carinatis. *Corolla* infundibuliformis, calyce longior, lilacina, fauce nuda, limbo 4-loba: *lobis* lineari-oblongis, obtusis, æstivatione convolutis. *Stamina* 4, inclusa: *filamenta* subulata: *antheræ* subrotundo-ovatæ, obtusæ. *Ovarium* obfusiforme, infernè attenuatum. *Stylus* nullus. *Stigma* bilobum, minutè papillosum.

I regret that I have seen no specimen of this remarkable plant, those collected by Dr. Royle having been either lost or mislaid; the foregoing description, therefore, is necessarily very imperfect, having been wholly derived from the drawing taken at Mussooree, where the plant was first observed by Dr. Royle.

The form of the ovarium, and the sessile stigma, as well as the naked corolla, have induced me to place the species in this group: but its situation in the family must remain doubtful until the plant is examined.

The twisted æstivation of its corolla, analogous to that of the *Apocyneæ*, and the apparent presence of four imperfect stamens, incline me to suspect that it may prove to be the type of a distinct genus.

*** Annuæ, corollâ tubulosâ, staminibus sinubus corollæ insertis, stigmatibus filiformibus, capsulâ oblongâ apice simplici, seminibus compressis.*

2. *G. canaliculata*, caulescens, erecta, ramosa; segmentis calycinis cuneatis mucronatis, corollæ lobis ovatis acutiusculis, foliis ovato-lanceolatis obtusis margine scabris.

Gentiana canaliculata. *Royle MSS. G. Don Syst. Gard. & Bot.* iv. *p.* 182.

Habitat in Cashmeriâ. *Royle.* ⊙.

Radix subfusiformis, flava, copiosè fibrosa, annua. *Caulis* strictus, ramosus, bisulcus, spithamæus v. pedalis. *Folia* sessilia, ovato-lanceolata, obtusa, membranacea, sub-5-nervia, margine oculo armato scabra, basi distincta, nec connata, pollicaria v. sesquipollicaria. *Flores* axillares et terminales, racemoso-paniculati. *Pedunculi* filiformes, bisulci, vix unciales. *Calyx* amplus, membranaceus, profundè 4—5-partitus: *laciniis* obovatis, abruptè acuminatis, subæqualibus, margine copiosè papillosis. *Corolla* dilutè cœrulea, calyce longior, tubulosa, glaberrima, limbo 4—5-loba: *lobis* ovatis, acutiusculis. *Stamina* 4 v. 5, sinubus corollæ inserta: *filamenta* subulata, brevissima: *antheræ* oblongæ, incumbentes, 2-loculares, cyaneæ. *Stigmata* filiformia, truncata, recta, minutè papillosa. *Capsula* ovato-oblonga, compressa, membranacea, brevissimè stipitata. *Semina* parietalia, grandiuscula, hinc convexa, inde exsculpta, spadicea, glabra.

Gen. I. PNEUMONANTHE. *Schmidt.*

Dasystephana et Ciminalis. *Borck.*

Gentianæ sp. *L.*

Calyx tubulosus, 5-dentatus. *Corolla* infundibuliformis v. campanulata, 5-loba: *sinubus* plerumque in lobos productis. *Antheræ* oblongæ, sæpiùs coalitæ. *Stigma* bipartitum. *Capsula* 1-locularis. *Semina* parietalia, scobiformia, margine alata.

Herbæ (Hem. Bor.) *perennes, floribus subsolitariis speciosis plerumque cœruleis.*

** Corollæ sinubus in lobos productis, antheris liberis.*

1. *P. Kurroo*, caulescens, subuniflora; dentibus calycinis elongatis subulatis,

corollâ campanulatâ: lobis acutis, foliis obtusis; radicalibus elongato-lanceolatis; caulinis linearibus.

Gentiana Kurroo. *Royle Ill. t.* 68. *f.* 2.

Habitat in Emodi montibus ad Mussooree et Kuerkoolee loca vernaculè dicta. *Royle.* ♃. Fl. Octobri et Novembri. Kurroo *indigenis.*

Planta perennis, cæspitosa. *Radix* longa, ramosa, flava, collo bipollicari foliorum emarcidorum basibus fuscis obtecto. *Caules* plures, assurgentes, filiformes, purpurascentes, 1—3-flori, palmares v. spithamæi, nunc pedales, filo emporetico vix crassiores. *Folia radicalia* plurima, conferta, erecto-patentia, lanceolata, obtusa, coriacea, glabra, viridia, subtùs obscurè 3-nervia, margine parùm recurvata, infernè angustata, imâ basi tamen dilatato-membranacea, 4—5-uncialia, semipollicem circiter lata; *caulina* recurvato-patentia, linearia, obtusa, margine recurva, sesquiuncialia, basi in vaginam unguicularem connata. *Calyx* tubulosus, 5-dentatus, interstitiis membranaceis: *dentibus* subulatis, erectis, tubum subæquantibus. *Corolla* infundibuliformi-campanulata, azurea, calyce duplò longior, sesquipollicaris, limbo 5-loba; *lobis* ovatis, acutis, sinubus prominentibus acutis integris. *Filamenta* canaliculata, basi dilatata. *Antheræ* oblongæ, obtusæ, incumbentes, biloculares, flavæ. *Ovarium* fusiforme, pedicellatum. *Stigma* bipartitum: laciniis ligulatis. *Capsula* 1-locularis, 2-valvis, polysperma. *Semina* parietalia, subacicularia, fusca, apice truncata umbilicata, alterâ extremitate alatâ.

This fine species comes very near to *P. adscendens,* which is chiefly distinguished by its acute leaves, more numerous flowers, thrice shorter calycine teeth, and by the blunt lobes of the corolla. Its root, which is intensely bitter, is used as a tonic and febrifuge by the natives. This genus is principally distinguished from *Gentiana,* as now limited, by its deeply-parted stigma, winged seeds, and by the presence of accessory appendages alternating with the lobes of the corolla.

2. *P. depressa,* subcaulis, cæspitosa, uniflora, surculosa; dentibus calycinis ovato-lanceolatis mucronatis, corollâ campanulatâ: lobis integerrimis aristatis, foliis lanceolatis mucronatis margine scabris; surculinis obovatis.

Gentiana depressa. *Don Prodr. Fl. Nep. p.* 125. *Wall. Cat. n.* 4387.
Ericala depressa. *Nob. in G. Don Syst. Gard. & Bot.* iv. *p.* 189.
Habitat in Emodi montibus ad Shalma. *Royle.* ♃. Fl. Octobri.

Planta perennis, depressa, cæspitosa, acaulis, nunc surculosa. *Radix* fibrosa, fibris longis attenuatis fuscis. *Surculi* plures, procumbentes, filiformes, bipollicares, undique minutè papulosi, quandoque floriferi. *Folia radicalia* in rosulis aggregata, patentia, lanceolata, mucronata, glauco-viridia, margine cartilaginea ac papuloso-scabra, subtùs carinata, semuncialia; *surculina* duplò breviora, obovata, margine copiosiùs papulosa, basibus angustatis atque in vaginam caule ipso ampliorem connatis. *Flos* terminalis, solitarius, omninò sessilis. *Calyx* tubulosus, 5-fidus: *laciniis* ovato-lanceolatis, mucronatis, erectis, carinatis, margine apiceque cartilagineis, sinubus membranaceis. *Corolla* uncialis, infundibuliformi-campanulata, pallidè cœrulea, fasciis atro-violaceis notata, limbo 5-loba: *lobis* rotundatis, mucronato-aristatis, margine involutis, integerrimis: *sinubus* dilatatis, membranaceis, albis, in lobos rotundatos, obtusos, muticos productis. *Filamenta* canaliculata, glabra, infernè membranaceo-dilatata. *Antheræ* lineari-oblongæ, obtusæ, biloculares, incumbentes. *Ovarium* fusiforme, stipitatum. *Stylus* elongatus. *Stigma* bipartitum: *laciniis* lanceolatis, mucronulatis, concavis, minutè papillosis. *Capsula* elliptica, membranacea, longè stipitata, 1-locularis, 2-valvis. *Semina* parietalia, testâ laxâ, corrugatâ, membranaceo-alata.

This is a very distinct species, and there is none with which it can well be compared. In habit it resembles a good deal the *Ericala altaica.*

Gen. II. ERICALA. *Renealm.*

ERICOILA. *Borck.*

HIPPION. *Schmidt.*

GENTIANÆ SP. *L.*

Calyx 5-fidus. *Corolla* tubulosa v. hypocrateriformis, 4—5-fida: *sinubus* plerumque in lobos productis. *Stylus* elongatus. *Stigmata* 2, distincta, dila-

tata. *Capsula* 1-locularis. *Semina* parietalia, oblonga, angulata, immarginata.

Herbæ (Hem. Bor.) *perennes v. annuæ, floribus solitariis v. subcorymbosis, aut fasciculatis.*

* *Annuæ, corollâ tubulosâ, sinubus in lobos productis, capsulâ cuneatâ compressâ stipitatâ apice cristatâ.*

1. *E. capitata,* caulescens, simplex; foliis ovatis, floribus aggregatis, dentibus calycinis ovatis mucronatis recurvis, corollæ lobis obtusis: sinubus crenatis.

Ericala capitata. *Nob. in G. Don Syst. Gard. & Bot.* iv. *p.* 193.

Gentiana capitata. *Ham. in Don Prodr. Fl. Nep. p.* 126.

G. marginata. *Wall. Cat. n.* 4391.

Habitat in Emodi montibus ad Mussooree in rupibus. *Royle.* ⊙. Fl. Septembri.

Radix fibrosa, annua. *Caulis* erectus, simplicissimus, purpureus, angulis parùm elevatis sed vix alatis notatus, infernè nudus, apice foliosus. *Folia* petiolata, ovata, mucronata, rariùs obtusiuscula, coriacea, lævia, integerrima, viridia, subtùs pallidiora, vix uncialia. *Flores* numerosi, terminales, sessiles, aggregati. *Bracteæ* foliaceæ, sessiles, ovatæ, mucronatæ, circum flores involucrum mentientes. *Calyx* infundibuliformis, membranaceus: *laciniis* ovatis, carinatis, apice spinuloso-mucronatis, tortuosis, recurvis, margine scariosis. *Corolla* dilutè cœrulea, infundibuliformis, calycem parùm excedens, limbo 5-loba: *lobis* ovatis, muticis, margine involutis: *sinubus* rotundatis, crenatis, membranaceis, brevissimis. *Stamina* longè inclusa: *filamenta* capillaria: *antheræ* lineari-oblongæ, incumbentes, biloculares. *Stigmata* semicylindrica, spiraliter revoluta, minutè papillosa. *Capsula* cuneata, compressa, crustacea, apice carinâ callosâ cristata. *Semina* parietalia, exigua, ovata, spadicea.

2. *E. argentea,* acaulis; foliis calycibusque lanceolatis mucronatis conduplicatis recurvis margine scariosis, floribus fasciculatis, corollæ lobis ovatis acuminatis.

Ericala argentea. *Nob. in G. Don Syst. Gard. & Bot.* iv. *p.* 192.

Gentiana argentea. *Royle MSS.*

Habitat in Emodi montibus ad Mussooree. *Royle.* ☉. Fl. Aprili.

Planta annua, è ramis brevissimis congestis foliosis fasciculata, uncialis v. sesquiuncialis. *Radix* filiformis, extremitate ramoso-fibrosa. *Folia* conferta, sessilia, undique recurvato-patentia, lanceolata, setaceo-mucronata, conduplicata, carinata, cartilaginea, glabra, argentea, nitida, semuncialia, margine scarioso-membranaceo, albo, tenuissimè serrulato. *Flores* copiosi, sessiles, aggregati, bracteati. *Calyx* tubulosus, 5-fidus: *laciniis* bracteisque lanceolatis, setaceo-mucronatis, recurvato-patentibus, conduplicatis, carinatis, squarrosis, margine latiore scarioso-membranaceo. *Corolla* tubulosa, dilutè cœrulea, calycis longitudine, limbo 5-loba: *lobis* ovatis, acuminatis, margine supernè involutis: *sinubus* in lobos breviores, ovatos, obtusos, integros, membranaceos productis. *Stamina* inclusa: *filamenta* subulata: *antheræ* lineares, incumbentes, biloculares. *Ovarium* cuneato-oblongum, subsessile, apice brevitèr alatum. *Stylus* filiformis, elongatus. *Stigmata* linearia, obtusa, minutè papillosa.

3. *E. marginata*, caulescens, ramosa; foliis lanceolatis mucronulatis planis margine cartilagineis, floribus fasciculatis, dentibus calycinis ovato-lanceolatis mucronatis erectis, corollæ lobis obtusis: sinubus acutis.

Ericala marginata. *Nob. in G. Don Syst. Gard. & Bot.* iv. *p.* 192.

Habitat in Cashmeriâ. *Royle.* ☉.

Radix fibrosa, annua. *Caulis* erectus, ramosus, foliosus, uncialis v. biuncialis. *Folia* sessilia, lanceolata, mucronulata, coriacea, lævia, unicostata, basi connata, margine albo-cartilaginea, vix uncialia. *Flores* subsessiles, fasciculati. *Bracteæ* lanceolatæ, mucronulatæ, margine apiceque cartilagineæ. *Calyx* tubulosus, unguicularis, 5-dentatus: *dentibus* ovato-lanceolatis, mucronatis, erectis, margine scariosis. *Corolla* cyanea, calyce longior, tubulosa, limbo 5-loba: *lobis* ovalibus, obtusis; *sinûs* paullò minoribus, acutis, integris, membranaceis. *Stamina* inclusa: *filamenta* complanata, infernè dilatata: *antheræ* oblongæ, incumbentes, luteæ. *Ovarium* fusiforme, membranaceum. *Stylus* elongatus, dimidii ovarii longitudine. *Stigmata* oblonga, plana, obtusa, minutè papillosa.

4. *E. decemfida,* caulescens, ramosa; dentibus calycinis subulatis mucronatis rectis, corollæ lobis lanceolatis acuminatis: sinubus bidentatis, foliis radicalibus ovatis mucronatis maximis; summis subulatis.

Ericala Royleana. *G. Don Syst. Gard. & Bot.* iv. *p.* 192.

Gentiana decemfida. *Ham. in Don Prodr. Fl. Nep. p.* 126. *Wall. Cat. n.* 4392.

G. Royleana. *Wall. Cat. n.* 4393.

Habitat in Emodi montibus ad locum Khiree Pass vernaculè dictum. *Royle.* ⊙. Fl. Aprili.

Radix fibrosa, annua. *Caulis* erectus, ramosissimus, filiformis, gracilis, purpureus, flexuosus, 2—6-uncialis. *Folia radicalia* pauciora, maxima, patula, ovata, mucronato-aristata, sessilia, plana, 3-nervia, glabra, suprà viridia, subtùs glauca, basi angustiora, ferè uncialia, vix semipollicem lata; *caulina* lineari-lanceolata, acuminato-mucronata, conduplicata, basi connata, margine carinâ apiceque cartilagineis minutissimèque denticulatis; *superiora* subadpressa, subulata. *Flores* copiosi, solitarii, pedicellati. *Calyx* tubulosus: *laciniis* elongatis, subulatis, setaceo-mucronatis, strictis, æqualibus. *Corolla* tubulosa, 5-fida, calyce duplò longior: *lobis* lanceolatis, acuminatis; *sinûs* duplò brevioribus, obtusis, bidentatis, membranaceis. *Stamina* inclusa: *filamenta* capillaria: *antheræ* oblongæ, incumbentes, biloculares. *Ovarium* compressum. *Stigmata* 2, teretia, revoluta, minutè papillosa. *Capsula* cuneata, compressa, coriacea, brevitèr stipitata. *Semina* parietalia, minuta, ovoidea, fusca.

5. *E. pedicellata,* caulescens, ramosissima; dentibus calycinis lanceolatis mucronatis revolutis, corollæ lobis ovatis acuminatis: sinubus integris, foliis lanceolatis acuminatis, capsulâ longè stipitatâ.

Ericala procumbens. *G. Don Syst. Gard. & Bot.* iv. *p.* 192.

Gentiana pedicellata. *Wall. Cat. n.* 4394.

β. Foliis subæqualibus.

Habitat in Emodi montibus in convalli Deyra et ad Mussooree: β. in Kunawur. *Royle.* ⊙. Fl. Septembri et Octobri.

Radix filiformis, extremitate ramoso-fibrosa, annua. *Caules* plurimi, filiformes, ramosissimi, procumbentes, foliosi, 1—3-pollicares. *Folia radicalia* aggregata, patentia, lanceolata, acuminata, plana, 3-nervia, basi attenuata,

subpetiolata, sesquipollicaria; *caulina* multò minora, mucronata, immarginata, patentia, sessilia, basi connato-vaginata. *Flores* pedicellati, subaggregati. *Calyx* tubulosus: *laciniis* lanceolatis, mucronatis, recurvato-patentibus, immarginatis. *Corolla* tubulosa, limbo 5-loba: *lobis* ovatis, acuminatis; *sinûs* rotundatis, obtusis, brevissimis. *Stamina* inclusa: *filamenta* subulata: *antheræ* lineares, incumbentes, 2-loculares. *Stylus* brevis, compressus. *Stigmata* semicylindrica, revoluta. *Capsula* cuneata. ancipiti-compressa, longè stipitata, apice alâ angustâ membranaceâ erosè crenulatâ cristata. *Semina* parietalia, elliptica, fusca.

The Siberian *E. aquatica* is closely allied to this species, being distinguished from it solely by its obovate leaves with a cartilaginous border, erect calycine teeth, and by the lobes of the corolla being pointless. They both agree in having the capsule elevated on a long stalk.

Gen. III. EURYTHALIA. *Renealm., Borck.*

HIPPION ex parte. *Schmidt.*

GENTIANÆ SP. *L.*

Calyx 4—5-fidus. *Corolla* hypocrateriformis, limbo 4—5-fida: *fauce* fimbriato-barbatâ. *Stigma* bifidum. *Capsula* 1-locularis. *Semina* parietalia, subrotunda, immarginata, lævia.

Herbæ (europææ v. asiaticæ) *annuæ, floribus solitariis v. corymbosis.*

Well distinguished from the preceding group by the fringed throat of its corolla. This fringe, composed of a series of narrow linear segments, is not to be confounded with the accessory lobes, but is clearly of the same nature with the fringed glands found at the base of the petals of *Swertia* and *Agathotes.*

1. *E. coronata,* brevitèr caulescens; floribus aggregatis, corollâ 10-lobâ: lobis sinubusque subæqualibus ovatis uniformibus, foliis lanceolatis acutis margine cartilagineis.

Ericala coronata. *G. Don Syst. Gard. & Bot.* iv. p. 193.

Gentiana coronata. *Royle Ill. t.* 68. *f.* 1.

Habitat in Emodi montibus ad Kedarkanta. *Royle.* ⊙.

Planta fasciculata, depressa, subacaulis, pollicaris v. tripollicaris. *Radix* filiformis, annua, extremitate ramoso-fibrosa. *Folia* conferta, sessilia,

patula, lanceolata, acuta, obsoletè 3-nervia, margine cartilaginea, semi- v. pollicaria. *Flores* aggregati, sessiles. *Bracteæ* lanceolatæ, mucronulatæ, membranaceæ, basi connatæ. *Calyx* tubulosus, 5-dentatus: *dentibus* ovatis, mucronulatis, erectis, margine scariosis. *Corolla* tubulosa, calyce longior, cyanea, limbo patula, 10-loba; *fauce* annulo fimbriato e ciliis linearibus acutis planis composito coronatâ: *lobis* ovatis, obsoletè mucronulatis; *sinûs* conformibus, vix brevioribus. *Stamina* inclusa: *filamenta* subulata, basi dilatata: *antheræ* oblongæ, incumbentes. *Ovarium* ovale. *Stylus* elevatus. *Stigmata* semicylindrica, obtusa, revoluta, minutè papillosa.

This very elegant little alpine species has the corolla regularly ten-cleft, from the accessory lobes being equal and uniform with the primary ones. The flowers are crowded and of a deep blue.

2. *E. carinata*, caulescens, simplex; foliis lanceolatis mucronatis carinatis, floribus fasciculatis, corollâ 10-lobâ: lobis lanceolatis acuminatis; sinûs duplò brevioribus argutè denticulatis.

Ericala carinata. *G. Don Syst. Gard. & Bot.* iv. *p.* 189.

Habitat in Emodi montibus ad Mussooree. *Royle.* ⊙?

Radix fibrosa, annua? *Caulis* erectus, teres, purpurascens, sesquipollicaris. *Folia* sessilia, conferta, lanceolata, mucronata, conduplicata, subtùs carinata, semuncialia, imâ basi connata, carinâ margineque cartilagineis. *Flores* terminales, complures, aggregati, subsessiles, bracteati. *Calyx* tubulosus, 5-fidus: *laciniis* linearibus, mucronatis, erectis, margine scariosis. *Corolla* infundibuliformis: *fauce* ciliis setaceis albis pluriserialibus barbatâ: *limbo* 5-lobo: *lobis* lanceolatis, acuminatis; *sinûs* duplò brevioribus, argutè denticulatis. *Stamina* inclusa: *filamenta* capillaria, glabra: *antheræ* lineares, incumbentes. *Stigmata* revoluta, minutè papillosa. *Capsula* cuneato-oblonga, apice alata.

3. *E. pedunculata*, caulescens, ramosa, diffusa; pedunculis elongatis filiformibus unifloris, corollâ 5-fidâ calyce ter longiore, laciniis calycinis ovatis obtusiusculis.

Gentiana pedunculata. *Royle MSS. G. Don Syst. Gard. & Bot.* iv. *p.* 182.

Habitat in Cashmeriâ et Kunawur. *Royle.* ⊙.

Radix fibrosa. *Caulis* diffusè ramosissimus, bicanaliculatus, 3—5-uncialis. *Folia* sessilia, ovato-oblonga, obtusa, membranacea, unguicularia, basi distincta; *inferiora* spathulata; *superiora* ovata. *Pedunculi* filiformes, stricti, uniflori, sesqui- v. tri-pollicares. *Calyx* profundè 5-partitus: *segmentis* foliaceis, ovato-oblongis, obtusiusculis, inæqualibus; *lateralibus* 2 duplò majoribus. *Corolla* tubulosa, azurea, calyce ter longior: *fauce* intùs annulo fimbriato e ciliis angustè linearibus acutis composito coronatâ: *limbo* 5-lobo, erecto: *lobis* ovatis, obtusis; *sinubus* non productis. *Stamina* tubo inserta: *filamenta* canaliculata: *antheræ* oblongæ, incumbentes, 2-loculares. *Ovarium* oblongum, sessile. *Stigmata* obtusa, brevissima, minutè papillosa. *Capsula* subcylindracea, membranacea. *Semina* parva, subrotunda, fulva, punctis excavata.

This affords another striking example of the great similarity that prevails between the vegetation of the Himalaya and that of Siberia. It comes so very near to *E. dichotoma* from the latter country, as to be hardly distinguishable, differing only in the blunt segments of its calyx, and longer corolla.

Gen. IV. CRAWFURDIA. *Wall.*

Calyx tubulosus, 5-dentatus. *Corolla* infundibuliformi-campanulata, 5-loba. *Glandulæ nectariferæ* 5 hypogynæ. *Stigmata* 2, distincta, subfiliformia. *Capsula* stipitata, compressa, crustacea, 1-locularis. *Semina* marginalia, suborbiculata, compressa, marginata.

Herbæ (himalenses) *perennes.* Caules *volubiles!* Folia *opposita, petiolata, 3—5-nervia.* Flores *axillares, magni, speciosi, cærulei v. albi.*

In structure this genus comes near to *Pneumonanthe,* but differs in its twining habit, filiform stigmas, and compressed orbicular seeds attached to the margin of the valves. It has entirely the habit of *Gelsemium,* and affords a beautiful example of the intimate relationship subsisting between *Gentianeæ* and *Apocyneæ.*

1. *C. speciosa,* foliis ovatis acuminatis 5-nerviis, pedunculis solitariis subnudis, dentibus calycinis abbreviatis, capsulâ ellipticâ stipite breviore.

Crawfurdia speciosa. *Wall. Tent. Fl. Nep. p.* 64. *t.* 48; *Cat. n.* 4371.

Habitat in Emodi montibus ad Surkunda. *Royle.* ♃. Fl. Augusto.

2. *C. fasciculata,* foliis lanceolatis acuminatis 3-nerviis, pedunculis subaggregatis bibracteatis, dentibus calycinis subulatis elongatis, capsulâ obovatâ stipite ter longiore.

Crawfurdia fasciculata. *Wall. Tent. Fl. Nep. p.* 63. *t.* 47.; *Cat. n.* 4369.

C. affinis. *Wall. Cat. n.* 4370.

Gentiana volubilis. *Don Prodr. Fl. Nep. p.* 126.

Habitat in Nepaliâ. *Wallich.* ♃.

Gen. V. SWERTIA.

Swertiæ sp. *L.*

Calyx profundè 5-partitus. *Corolla* 5-partita, rotata, persistens: *segmentis* basi biglandulosis: *glandulis* dilatatis, callosis, margine fimbriatis. *Stigma* bilobum. *Capsula* compressa, crustacea, 1-locularis. *Semina* parietalia, orbiculata, complanata, margine membranacea.

Herbæ (Europæ et Asiæ frigidioris) *perennes.* Folia *nervosa, quandoque alterna!* Flores *terminales et axillares, subsolitarii v. racemoso-paniculati, cœrulei aut lutei.*

A very natural and well-defined group, consisting of *Swertia perennis, obtusa,* and the species here described, and characterized by its flat orbicular winged seeds, and by the fringed nectariferous glands at the base of the petals. Nearly related to this genus are *Asterias* (*Gentiana lutea,* L.) and *Frasera,* the former distinguished by the naked glands of its petals, and long narrow stigmata, and the latter by its deciduous corolla and marginal placentation.

The *S. obtusa* and *alternifolia* exhibit in their alternate leaves a remarkable peculiarity in this family, closely approximating by this character and also by their fringed petals to the *Menyantheæ.*

1. *S. speciosa,* foliis oppositis connato-vaginantibus elliptico-oblongis acuminatis 7-nerviis, floribus racemoso-paniculatis, corollæ segmentis acuminatis: glandulis connatis.

Swertia speciosa. *Wall. Cat. n.* 4384.

S. perfoliata. *Royle MSS. Don Syst. Gard. & Bot.* iv. *p.* 176.

Habitat in Cashmeriâ, et in Emodi montibus ad Choor et Kedarkanta. *Royle.* ♃.

Herba perennis, magnitudine et facie *Asteriæ luteæ*. *Radix* crassa, fusiformis, horizontalis, sordidè flava, fibris longis crassis. *Caulis* erectus, ramosus, teres, 3-pedalis et ultrà, digiti minoris crassitie. *Folia* opposita, elliptico-oblonga, acuminata, 7-nervia, glabra, lævissima, spithamæa, latitudine 3-uncialia; *inferiora* petiolata, petiolis dilatatis, basi connato-vaginantibus; *superiora* sessilia, basi connata. *Flores* copiosissimi, racemoso-paniculati, cernui. *Pedunculi* filiformes, semi- v. pollicares, basi bracteâ lanceolatâ acuminatâ longiore muniti. *Calyx* 5-partitus: *segmentis* lanceolatis, acuminatis, glabris, patentibus, membranaceis. *Corolla* calyce longior, 5-partita, rotata: *segmentis* lanceolatis, obtusè acuminatis, basi biscrobiculatis: *scrobiculis* 2, subrotundis, parallelo-connatis, periphæriâ ciliis longis fimbriatis. *Stamina* 5, corollâ breviora: *filamenta* subulata, canaliculata: *antheræ* oblongæ, obtusæ, biloculares, incumbentes: *loculis* parallelis, longitudinalitèr dehiscentibus, basi solutis. *Ovarium* ovatum, 1-loculare. *Stylus* brevissimus. *Stigma* bilobum: *lobis* planis, suborbiculatis, minutè papillosis.

2. *S. petiolata*, foliis oppositis petiolatis oblongis obtusis 5-nerviis, floribus racemoso-paniculatis, corollæ segmentis obtusis: glandulis distinctis filamentoso-ciliatis.

Swertia petiolata. *Royle MSS.*

S. speciosa. *G. Don Syst. Gard. & Bot.* iv. *p.* 170. non *Wall.*

Habitat in Cashmeriâ. *Royle.* ♃.

Herba perennis. *Caulis* erectus, dodrantalis pedalisve, lævis. *Folia* opposita, petiolata, spathulato-oblonga, obtusa, 5-nervia, basi attenuata, 2-pollicaria, semunciam lata. *Petioli* lineares, basi connato-vaginantes, sæpè 3-pollicares. *Panicula* coarctata, racemosa, multiflora. *Calyx* 5-partitus: *segmentis* lanceolatis, acuminatis, margine membranaceis, inæqualibus. *Corolla* rotata, 5-partita, lutea, calyce ferè duplò longior: *laciniis* oblongis, obtusis: *scrobiculis* 2, orbiculatis, distinctis, periphæriâ ciliis longis capillaceis fimbriatis. *Stamina* 5, corollâ breviora: *filamenta* canaliculata, basi dilatata: *antheræ* oblongæ, incumbentes, 2-loculares, obsoletè mucronulatæ. *Ovarium* ovatum. *Stylus* vix ullus. *Stigma* bilobum: *lobis* orbiculatis, complanatis, minutè papillosis. *Capsula* ovato-oblonga, membranacea, 1-locularis. *Semina* majuscula, angulata! corrugato-cristata, fusca.

3. *S. alternifolia,* foliis alternis! elliptico-oblongis acuminatis 7-nerviis basi vaginantibus, floribus racemoso-paniculatis, corollæ segmentis ellipticis obtusis: glandulis orbiculatis contiguis.

Swertia alternifolia. *Royle, Ill. t.* 67. *f.* 2. *Nob. in G. Don Syst. Gard. & Bot.* iv. *p.* 176.

Habitat in Emodi montibus ad Choor et Kedarkanta. *Royle.* ♃.

Herba perennis, glabra. *Caulis* erectus, ramosus, cylindraceus, fistulosus, lævis, 2—3-pedalis, crassitie calami scriptorii. *Folia* elliptico-oblonga, acuminata, 5—7-nervia, membranacea, lævissima, lætè viridia, margine scabriuscula, 4—5 pollices longa, et 2 lata; *radicalia* petiolata; *caulina* alterna, amplexicaulia, brevitèrque vaginantia: *vaginâ* dilatatâ, semipollicari. *Petioli* dilatati, suprà canaliculati, margine alati, 3-pollicares. *Flores* axillares, magni, aurei, cernui, cymosi, in caulis summitate subsolitarii. *Cymæ* longè pedunculatæ, 3-floræ, per caulem racemoso-paniculatæ. *Pedunculi* filiformes, 3-unciales. *Bracteæ* lanceolatæ, acuminatæ, sessiles, sæpè oppositæ, pedicellis breviores. *Segmenta calycina* ovato-lanceolata, acuminata, 5-nervia, margine tenuissimè membranacea, erosèque crenulata. *Corolla* rotata, 5-partita, calyce longior: *laciniis* elliptico-oblongis, obtusis, 7-nerviis, basi biscrobiculatis: *scrobiculis* orbiculatis, contiguis, margine longè crebrèque filamentoso-fimbriatis: *ciliis* longis, subulatis, acutissimis, patentibus. *Stamina* corollâ duplò breviora: *filamenta* dilatata, canaliculata, glabra: *antheræ* oblongæ, incumbentes, biloculares: *loculis* parallelis, longitudinalitèr dehiscentibus, basi solutis. *Ovarium* ovale, læve. *Stigma* sessile, bilobum: *lobis* orbiculatis, margine revolutis, minutè papilloso-pruinosis.

4. *S. cuneata,* foliis oppositis petiolatis spathulato-oblongis obtusis 5-nerviis, floribus racemosis, corollæ segmentis obtusis: glandulis lineari-oblongis subremotis filamentoso-ciliatis.

Swertia cuneata. *Wall. Cat. n.* 4380. *Nob. in G. Don Syst. Gard. & Bot.* iv. *p.* 176.

Habitat in Emodi montibus ad Kedarkanta. *Royle.* ♃.

Radix fibrosa, perennis, sordidè flava. *Caulis* erectus, filiformis, lævis, 3—8-uncialis. *Folia* opposita, petiolata, oblongo-spathulata, obtusa, glabra,

3-nervia, membranacea, subtùs pallidiora, infernè attenuata, cum petiolis membranaceo-dilatatis 2—4-uncialia, semunciam lata; *radicalia* et *caulina inferiora* longiùs petiolata; *suprema* lineari-oblonga, subsessilia. *Flores* laxi, racemoso-paniculati. *Pedunculi* filiformes, purpurascentes, semi- v. pollicares. *Calyx* profundè 5-partitus: *segmentis* linearibus, acutis, 3-nerviis. *Corolla* dilutè cœrulea, rotata, altè 5-partita; *segmentis* elliptico-oblongis, obtusis, emarginatis, 5-nerviis, margine involutis, calyce duplò longioribus: *scrobiculis* lineari-oblongis, distantibus, periphæriâ ciliis longis capillaribus cœruleis fimbriatis. *Stamina* 5, corollâ breviora: *filamenta* canaliculata: *antheræ* oblongæ, obtusæ, incumbentes, azureæ. *Ovarium* fusiforme, longitudine staminum. *Stigma* bilobum: *lobis* rotundatis, planiusculis, minutè papillosis.

5. *S. cœrulea,* floribus subsolitariis, corollæ segmentis ovatis mucronulatis: glandulis linearibus distantibus, foliis inferioribus spathulatis petiolatis; superioribus calycibusque lanceolatis obtusiusculis.

Swertia cœrulea. *Royle Ill. t.* 67. *f.* 1. *Nob. in G. Don Syst. Gard. & Bot.* iv. *p.* 176.

Habitat in Cashmeriâ, atque in Emodi montibus ad Mussooree et Shalma. *Royle.* ♃.

Herba perennis, glabra. *Caules* erecti, graciles, obscurè tetragoni, purpurascentes, spithamæi. *Folia* membranacea, 3—5-nervia; *inferiora* petiolata (petiolis imâ basi vaginantibus), spathulata, obtusa; *superiora* sessilia, imâ basi connata, lanceolata, subconduplicata, apice recurvata, acuta, pollicaria. *Flores* racemosi, speciosi, azurei. *Pedunculi* axillares, solitarii, uniflori, unciales, subtetragoni, nunc rariùs trichotomi, 3-flori, medio bibracteati; *superiores* ebracteati, omninò uniflori. *Bracteæ* lineari-lanceolatæ, conduplicatæ, apice recurvatæ, acutæ. *Calyx* altè 5-partitus: *laciniis* lanceolatis, acutis, 3-nerviis, apice subrecurvis, ferè semipollicaribus. *Corolla* calyce multoties longior, profundè 5-partita: *segmentis* ovato-oblongis, obliquè mucronulatis, 7-nerviis (nervis ramosis), ungue flavicanti, biscrobiculato: *scrobiculis* linearibus, distantibus, margine supernè filamentoso-fimbriatis: *ciliis* angustè linearibus, obtusis, compressis. *Stamina* corollâ breviora: *filamenta* subulata, canaliculata,

glabra: *antheræ* oblongæ, biloculares: *loculis* parallelis, longitudinalitèr dehiscentibus, basi apiceque solutis. *Ovarium* obfusiforme, staminibus longius. *Stigma* terminale, sessile, parvum, levitèr bilobum. *Capsula* cuneato-oblonga, compressa, 2-valvis, basi attenuata, polysperma: *valvis* membranaceis, margine incrassatis, medio tantùm seminiferis. *Semina* minutissima, obovata, lævia, basi umbilico prominenti mucronata.

Gen. VI. AGATHOTES.

Swertiæ sp. *Wall.*

Gentianæ sp. *Roxb.*

Calyx 4-partitus. *Corolla* rotata, 4-partita: *segmentis* basi foveis nectariferis squamulâ fimbriatâ obtectis instructis. *Stigma* bilobum. *Capsula* 1-locularis, apice dehiscens. *Semina* marginalia, minuta, globosa, lævia.

Herbæ (himalenses) *annuæ, ramosæ.* Folia *opposita, amplexicaulia.* Flores *laxè paniculati, purpurei v. lutei.*

Besides habit and the four-cleft flowers, the minute globular seeds, their placentation on the margin of the valves, and the glands at the base of the petals being covered by a fringed scale, are the characters which have led me to separate this genus from *Swertia.*

1. *A. Chirayta,* caule tereti, foliis ovato-lanceolatis, foveis nectariferis oblongis distinctis: squamulis margine capillaceo-fimbriatis.

Agathotes Chirayta. *Nob. in G. Don Syst. Gard. & Bot.* iv. *p.* 182.

Swertia Chirata. *Wall. Cat. n.* 4372.

S. racemosa. *Ejusd. l. c. n.* 4377.

Gentiana Chirayta. *Roxb. MSS. Fleming in Asiat. Res.* xi. *p.* 167. *Ræm. et Schult. Syst.* vi. *p.* 142. *Wall. Pl. Asiat. Rar.* iii. *p.* 33. *t.* 252.

G. floribunda. *Don Prodr. Fl. Nep. p.* 128.

Habitat in Emodi montibus ad Mussooree. *Royle.* ⊙. Cherayita et Dukhuni Cherayita *indigenis.*

Herba atrovirens. *Radix* ramoso-fibrosa, annua. *Caulis* erectus, ramosus, rigidus, cubitalis, crassitie pennæ corvinæ, intùs cavus. *Folia* amplexicaulia, ovato-lanceolata, acuminata, 7-nervia, membranacea, atro-viridia,

utrinque lævissima, 3—5-uncialia, unciam v. sesquiunciam lata. *Flores* copiosissimi, laxè paniculati, lurido-purpurei. *Pedicelli* graciles, quadranguli, unguiculares. *Calyx* profundè 4-partitus: *segmentis* lineari-lanceolatis, acuminatis, apice recurvis. *Corolla* calyce paullò longior, 4-partita: *laciniis* ovatis, acutis, basi foveis 2 nectariferis oblongis parallelo-contiguis squamulâ fimbriatâ tectis auctis. *Stamina* corollâ breviora: *filamenta* subulata, canaliculata, glabra: *antheræ* cordatæ, obtusæ. *Ovarium* ovatum, læve, apice in stylum attenuatum. *Stigma* bilobum: *lobis* obtusis, brevissimis, pruinosis. *Capsula* membranacea, 1-locularis: *valvis* margine placentiferis, hinc apice bifidis. *Semina* minuta, lævia.

The whole plant possesses an agreeable aromatic bitter, much more pleasant than that of Gentian root or *Erythræa Centaurium.* The dried herb yields the most valuable kind of Cherayita, denominated "Dukhuni Cherayita," so famed among Indian practitioners as a tonic. Samples of the dried herb, obtained by Dr. Royle from the bazaars of India, leave no doubt of the present species affording the sort above mentioned.

2. *A. alata*, caule tetragono alato, foliis ovatis, foveâ nectariferâ orbiculatâ: squamulâ rotundatâ fimbriatâ.

Agathotes alata. *Nob. in G. Don Syst. Gard. & Bot.* iv. *p.* 177.

Swertia alata. *Royle MSS.*

Habitat in Emodi montibus ad Choor. *Royle.* ⊙.

Radix ramoso-fibrosa, annua. *Caulis* erectus, ramosus, rigidus, tetragonus, angulis membranaceis, alatis. *Folia* opposita, sessilia, subamplexicaulia, ovato-oblonga, obtusa, 5-nervia, subcoriacea, pollicaria, basi per caulis angulos decurrentia. *Flores* paniculati, flavi? *Bracteæ* lineares, acutæ, margine revolutæ. *Pedicelli* brevissimi, 4-anguli, graciles. *Calyx* profundè 4-partitus: *segmentis* lanceolatis, mucronatis, glabris, apice recurvato-patentibus. *Corolla* calycis vix longitudine, 4-partita: *laciniis* ovatis, acutis, basi foveolâ orbiculatâ margine puberulâ squamulâ unicâ ciliatâ tectâ. *Stamina* corollâ breviora: *filamenta* subulata: *antheræ* oblongo-cordatæ, obtusæ, biloculares. *Ovarium* ovatum, in stylum attenuatum. *Stigma* bilobum: *lobis* orbiculatis, pruinosis. *Capsula* ovata, 1-locularis: *valvis* margine placentiferis. *Semina* minuta, lævia.

Gen. VII. OPHELIA.

Swertiæ sp. *Ham.*, *Wall.*

Calyx 4—5-partitus. *Corolla* rotata, 4—5-partita. *Glandulæ nectariferæ* ad laciniarum basin 2, omninò nudæ! *Stigma* bilobum. *Capsula* membranacea, 1-locularis, apice dehiscens. *Semina* marginalia, minuta, angulata, scrobiculata.

Herbæ (Indiæ orient.) *annuæ, ramosæ, floribus paniculatis plerumque luteis v. albis.*

This is a very natural genus essentially distinguished from the preceding by the naked glands at the base of the petals. The species agree with *Agathotes* in their medicinal properties, and afford several kinds of Cherayita.

* *Glandulæ nectariferæ* 2 *conferruminatæ.*

1. *O. angustifolia,* floribus 4-fidis, foliis petiolatis lineari-lanceolatis acutis, segmentis calycinis linearibus mucronulatis, corollæ laciniis ovatis acuminatis calyce brevioribus.

Ophelia angustifolia. *Nob. in G. Don Syst. Gard. & Bot.* iv. *p.* 178.

Swertia angustifolia. *Ham. in Don Prodr. Fl. Nep. p.* 127. *Wall. Pl. Asiat. Rar.* iii. *p.* 2. *t.* 204.; *Cat. n.* 4373.

Habitat in Emodi montibus ad Mussooree. *Royle.* ☉. Puharee Cherayita *indigenis.*

Radix fibrosa, annua. *Caulis* erectus, ramosus, rigidus, fistulosus, purpurascens, levitèr 4-angulus, cubitalis, magis coarctatus quàm in sequente. *Folia* brevissimè petiolata, lineari-lanceolata, acuta, 3-nervia, suprà viridia, subtùs pallidiora, glaucescentia, basi attenuata, utrinque glaberrima, sesqui- v. bi-pollicaria. *Flores* laxè paniculati. *Pedunculi* capillares, breves, tetragoni. *Calyx* 4-partitus: *segmentis* lineari-lanceolatis, acutis. *Corolla* 4-partita, calyce longior, alba, punctis violaceis copiosè notata: *laciniis* ovato-oblongis, mucronulatis, basi biglandulosis, nudis. *Stamina* 4, corollâ breviora: *filamenta* gracilia, subulata, glabra: *antheræ* cordatæ, obtusæ, incumbentes, biloculares. *Ovarium* staminum longitudine, ellip-

tico-oblongum, 1-loculare, apice in stylum attenuatum. *Stigma* bilobum, minutè papillosum. *Capsula* 1-locularis: *valvis* subcrustaceis, margine placentiferis. *Semina* exigua, angulata, scabra, atrofusca.

The herb is intensely bitter, more resembling the Gentian root than the *Agathotes Chirayta.* It is the "Puharee, or hill Cherayita," and is clearly much more powerful than the former.

2. *O. pulchella,* floribus 4-fidis, foliis lanceolato-linearibus acutis, segmentis calycinis lanceolatis acuminatis, corollæ laciniis ovatis mucronulatis calyce longioribus, caule tetragono.

Ophelia porrigens. *G. Don Syst. Gard. & Bot.* iv. *p.* 178.

Swertia pulchella. *Ham. MSS. Wall. Cat. n.* 4375.

β. minor, staturâ vix 3-pollicari, foliis parùm latioribus obtusiusculis.

S. elegans. *Wall. Cat. n.* 4376.

Habitat in Emodi montibus ad locum Khiree Pass Anglicè dictum; β. ad Mussooree. *Royle.* ⊙.

Radix fibrosa. Caulis erectus, ramosus, rigidus, tetragonus, intùs canali perangusto cavus, glaber. *Folia* subsessilia, lineari-lanceolata, acuta, 3-nervia, membranacea, glaberrima, lætè viridia, subtùs pallidiora, margine paululùm revoluta, sesqui- v. bi-pollicaria; *inferiora* basi attenuata, vix petiolata. *Flores* laxè paniculati. *Pedunculi* 4-angulares, graciles, semunciales. *Calyx* profundè 4-partitus: *segmentis* lanceolatis, acuminatis, glaberrimis. *Corolla* calyce plerumque longior, 4-partita, lutea: *laciniis* ovato-oblongis, mucronulatis, patulis, 3-nerviis, nervis ramosissimis. *Stamina* 4, corollâ breviora: *filamenta* subulata, glabra: *antheræ* cordatæ, obtusæ, incumbentes, biloculares. *Ovarium* ovatum, læve. *Stylus* vix ullus. *Stigma* bilobum: *lobis* brevissimis, rotundatis, minutè papillosis. *Capsula* ovato-oblonga, membranacea, 1-locularis, valvularum marginibus placentiferis. *Semina* exigua, angulata, spadicea, lævia.

This is closely related to the preceding species, being principally distinguished from it by the corolla exceeding the calyx in length.

3. *O. paniculata,* floribus 5-fidis, foliis linearibus scabris margine revolutis,

petiolis ciliatis, segmentis calycinis lanceolatis acuminatis, corollæ laciniis ovato-lanceolatis acuminatis calyce vix longioribus, caule tereti.

Ophelia Wallichii. *G. Don Syst. Gard. & Bot.* iv. *p.* 178.

Swertia paniculata. *Wall. Pl. Asiat. Rar.* iii. p. 3. *t.* 205.; *Cat. n.* 4374.

Habitat in Emodi montibus ad Mussooree. *Royle.* ⊙.

Radix fibrosa. *Caulis* erectus, ramosus, teres, angulis 2 obsoletissimis notatus, purpurascens, cubitalis, ad nodos papilloso-pubescens. *Rami* levissimè 4-anguli. *Folia* subpetiolata, lanceolato-linearia, acuta, 3-nervia, margine revoluta, suprà viridia, asperiuscula, præsertìm in junioribus, subtùs glauca, basi apiceque angustata, subpetiolata, parùm ciliata, sesqui- v. bi-pollicaria. *Flores* cymosi, paniculati. *Pedunculi* aggregati (3 v. 6), subcapillares, levitèr 4-anguli, apice incrassati, semi- v. pollicares. *Calyx* turbinatus, 5-partitus, papilloso-scabriusculus: *segmentis* lanceolatis, acuminatis, margine revolutis, 3-nerviis; 2 exterioribus majoribus. *Corolla* alba, calycis vix longitudine, 5-partita: *laciniis* ovatis, acuminatis, 5-nerviis, basi biglandulosis, lævibus. *Stamina* 5, corollâ breviora: *filamenta* subulata, glabra, omninò libera, purpurea, infernè dilatata, planiuscula, apice acuminata: *antheræ* incumbentes, cordatæ, biloculares, violaceæ. *Ovarium* ovatum, attenuatum, 1-loculare. *Stylus* elongatus. *Stigma* bilobum, minutè papillosum. *Capsula* membranacea, bivalvis. *Semina* minuta, lenticularia, lævia, fulvescentia.

4. *O. purpurascens*, floribus 5-fidis, foliis lanceolatis acuminatis 3-nerviis scabris, petiolis ciliatis, segmentis calycinis lanceolatis mucronatis, corollæ laciniis ovato-lanceolatis acuminatis basi bituberculatis calyce longioribus, filamentis basi connatis, caule teretiusculo.

Ophelia teres. *G. Don Syst. Gard. & Bot.* iv. *p.* 178.

Swertia purpurascens. *Wall. Cat. n.* 4379.

β. ciliata, vix spithamæa, magis papillosa; foliis brevioribus.

Ophelia ciliata. *G. Don Syst. Gard. & Bot.* iv. *p.* 178.

Swertia ciliata. *Royle MSS.*

Habitat in Emodi montibus ad Choor et Kedarkanta. *Royle.* ⊙.

Radix fibrosa, annua. *Caulis* erectus, paniculatìm ramosus, purpurascens, cubitalis, obtusè tetragonus, ad nodos præsertìm papilloso-scaber. *Folia*

lanceolata, acuta, 3-nervia, suprà asperiuscula, viridia, subtùs pallidiora, sesqui- v. bi-pollicaria, basi attenuata, ciliata, subpetiolata. *Flores* cymosi, paniculati. *Pedunculi* aggregati (3 v. 6), capillares, vix pollicares, apice simplici. *Calyx* 5-partitus: *segmentis* lanceolatis, acutis, subæqualibus. *Corolla* calyce longior, 5-partita: *laciniis* ovato-lanceolatis, acutis, pallidè purpureis, basi bituberculatis, glabris. *Stamina* corollâ breviora: *filamenta* subulata, basi connata, monadelpha! *antheræ* cordato-oblongæ, incumbentes, biloculares. *Pistillum* stamina superans: *ovarium* ovato-oblongum: *stylus* elongatus: *stigma* bifidum: *lobis* cuneatis, recurvatis, minutè papillosis. *Capsula* membranacea, 1-locularis, 2-valvis. *Semina* parva, lenticularia, fusca, hinc concava, subindè convexiuscula.

5. *O. cordata,* floribus 5-fidis, foliis sessilibus cordatis acutis 5-nerviis, segmentis calycinis ovato-lanceolatis acuminatis, corollæ laciniis oblongis obtusiusculis calyce brevioribus.

Ophelia cordata et Chirayta. *G. Don Syst. Gard. & Bot.* iv. *p.* 178.

Swertia cordata. *Wall. Cat. n.* 4378.

Habitat in Cashmeriâ ad Jhilam, et in Emodi montibus ad Mussooree. *Royle.* ⊙.

Radix fibrosa, annua. *Caulis* erectus, ramosus, 4-angulus, purpurascens. *Folia* opposita, amplexicaulia, ovata, acuta, 5-nervia, membranacea, glabra, pollicaria. *Flores* paniculati. *Pedicelli* graciles, 4-anguli, vix semipollicares. *Calyx* 5-partitus: *segmentis* lanceolatis, acutis, glabris. *Corolla* pallidè flava, calyce longior: *laciniis* oblongis, obtusis, basi bifoveolatis, nudis. *Stamina* corollâ breviora: *filamenta* gracilia: *antheræ* violaceæ, incumbentes: *loculis* longitudinalitèr dehiscentibus, basi solutis. *Pistillum* staminibus brevius: *ovarium* fusiforme: *stigma* bilobum: *lobis* orbiculatis, pruinosis. *Capsula* ovato-oblonga, membranacea: *valvis* margine placentiferis. *Semina* angulata, fusca, scrobiculata.

** *Glandulæ nectariferæ* 2 *oblongæ distinctæ.*

6. *O. lurida,* floribus 4-fidis, foliis superioribus cordatis acutis amplexicaulibus, segmentis calycinis lineari-lanceolatis mucronulatis, corollæ laciniis ovatis acuminatis calyce longioribus.

Ophelia lurida (malè lucida). *Nob. in G. Don Syst. Gard. & Bot.* iv. *p.* 179.
Swertia lurida. *Royle MSS.*
Habitat in Emodi montibus ad Mussooree. *Royle.* ⊙.

Herba amarissima. *Radix* fibrosa, annua, flava. *Caulis* erectus, rigidus, ramosissimus, tetragonus, fistulosus, glaber, viridis, bipedalis: *angulis* elevatis, membranaceis, angustissimis. *Folia radicalia* petiolata, spathulata, obtusa, patentia, sesquipollicaria; *caulina superiora* et *ramea* amplexicaulia, cordata, acuta, 5-nervia; *infima* oblonga, basi angustata, caulis apicem versus sensim minora. *Flores* parvi, copiosissimi, paniculati. *Calyx* 4-partitus: *segmentis* lanceolatis, acutis. *Corolla* calyce subduplò longior, lurido-purpurea, 4-partita: *laciniis* ovato-lanceolatis, acuminatis, 5-nerviis, basi biglandulosis, glabris: *glandulis* linearibus, distantibus. *Stamina* 4, corollâ breviora: *filamenta* subulata, glabra: *antheræ* cordatæ, mucronulatæ. *Pistillum* staminibus longius: *ovarium* ovatum, membranaceum, 1-loculare: *stylus* brevis: *stigmata* subcapitata, minutè papillosa. *Capsula* parva, ovata, membranacea. *Semina* exigua, angulata, lævia, pallidè fulva.

Gen. VIII. HALENIA. *Borck.*

Swertiæ sp. *L. et Auctt.*

Calyx 4—5-partitus. *Corolla* campanulata v. tubulosa, 4—5-fida: *laciniis* basi calcaratis! *Stamina* sinubus corollæ inserta. *Stigma* bilobum. *Capsula* sessilis, membranacea, 1-locularis. *Semina* marginalia, subrotunda v. oblonga, ventricosa, lævia.
Herbæ (asiaticæ et americanæ) *annuæ v. perennes, floribus umbellatis purpureis v. luteis.*

This constitutes one of the most distinct genera in the whole family. The petals, in place of having the fringed glands of *Swertia,* are produced behind into a hollow spur, which forms an obvious and beautiful mark to discriminate the genus from the rest of its coordinates. Of the twelve species known to us, two are Asiatic, and the rest American; and of these latter, five are natives of Peru and New Granada, and perennial.

1. *H. elliptica,* corollis campanulatis 4-fidis calcaribus filiformibus brevioribus, laciniis calycinis obtusis abbreviatis, foliis ellipticis obtusis 5-nerviis; inferioribus petiolatis.

Halenia elliptica. *Nob. in G. Don Syst. Gard. & Bot.* iv. *p.* 177.

Swertia centrostemma. *Wall. Cat. n.* 4385.

Habitat in Emodi montibus ad Choor et Kedarkanta. *Royle.* ☉.

Radix fibrosa, annua. *Caulis* erectus, ramosus, tetragonus, angulis angustè alatis, pedalis v. bipedalis, fistulosus. *Folia* opposita, elliptica, obtusa, glaberrima, 5-nervia, membranacea, uncialia, v. biuncialia; *inferiora* brevitèr petiolata. *Pedicelli* aggregati (3 v. 6), cymosi, pollicares v. bipollicares, capillares, 4-anguli, uniflori. *Bracteæ* ovato-lanceolatæ, obtusæ. *Calyx* 4-partitus: *laciniis* ovato-lanceolatis, acutiusculis. *Corolla* calyce longior, campanulata, 4-fida: *laciniis* ellipticis, mucronatis, conniventibus, posticè basi calcaratis: *calcaribus* filiformibus, obtusis, rectis, patentibus, calyce longioribus. *Stamina* 4, corollâ longiora: *filamenta* subulata, glabra: *antheræ* cordatæ, biloculares. *Ovarium* ovatum. *Stylus* longiusculus. *Stigma* bilobum, pruinosum. *Capsula* membranacea. *Semina* majuscula, elliptica, compressa, lævia, brunnescentia, hinc plana, inde levitèr exsculpta.

Gen. IX. ERYTHRÆA. *Renealm., Brown.*

CHIRONIÆ SP.

GENTIANÆ SP. *L.*

Calyx 5-fidus. *Corolla* infundibuliformis, limbo brevi, marcescens. *Antheræ* defloratæ spirales. *Stylus* erectus. *Stigma* 2, subrotunda. *Capsula* linearis. *Brown, Prodr.* i. *p.* 451.

1. *E. Roxburghii,* floribus pedunculatis corymbosis, corollæ laciniis lanceolatis acutis: tubo calycis longitudine, foliis superioribus linearibus 3-nerviis, caule quadrangulo.

Erythræa Roxburghii. *G. Don Syst. Gard. & Bot.* iv. *p.* 206.

Chironia centaureoides. *Roxb. Fl. Ind.* i. *p.* 584. *Wall. Cat. n.* 4397.

Habitat in Emodi montibus ad locum Khiree Pass Anglicè dictum. *Royle.* ☉. Fl. Octobri.

Gen. X. CANSCORA. *Lam., Brown.*

Pladera. *Soland., Roxb.*

Centaurium. *Borck.*

Exaci sp. *Willd.*

Gentianæ sp. *Vahl.*

Calyx tubulosus, 4-dentatus. *Corolla* infundibuliformis, marcescens: *limbo* brevi, inæquali, 4-fido, subbilabiato. *Stamina* 3 v. 4, inæqualia. *Antheræ defloratæ* strictæ. *Stylus* rectus. *Stigmata* 2, cuneata, revoluta. *Capsula* 1-locularis. *Placentæ* marginales. *Semina* subrotunda, scrobiculata, minutissima.

Herbæ (Indiæ Orient.) *annuæ, caule ramosissimo, floribus corymboso-paniculatis rubris.*

1. *C. diffusa,* caule subfiliformi, foliis inferioribus spathulatis petiolatis; superioribus sessilibus ovatis acutis, calycibus tubulosis apteris.

Canscora diffusa. *Brown Prodr.* i. p. 451. *G. Don Syst. Gard. & Bot.* iv. *p.* 199. *Wall. Cat. n.* 4361.

C. tenella. *Wall. Cat. n.* 4362.

C. foliosa. *Nob. in G. Don Syst. Gard, & Bot.* iv. *p.* 199.

Pladera virgata. *Roxb. Fl. Ind.* i. *p.* 401.

Exacum diffusum. *Willd. Sp. Pl.* i. *p.* 637.

Gentiana diffusa. *Vahl. Symb.* iii. *p.* 47.!

Habitat in Emodi montibus ad locum Khiree Pass Anglicè dictum. *Royle.* ⊙. Fl. Octobri.

2. *C. decussata,* caule tetragono alato, foliis sessilibus ovato-lanceolatis acutis 3-nerviis; superioribus distinctis, floribus pedunculatis, calycibus tetrapteris inflatis.

Canscora decussata. *Wall. Cat. n.* 4364. *G. Don Syst. Gard. & Bot.* iv. *p.* 199.

Pladera decussata. *Roxb. Fl. Ind.* i. *p.* 402.

Habitat cum præcedente. *Royle.* ⊙. Fl. Julio.

3. *C.? pusilla,* caule tetragono, foliis cordatis acutis sessilibus, floribus glome-

ratis, corollâ campanulatâ calyce breviore, stigmatibus globosis, capsulâ subrotundâ.

Canscora pusilla. *Wall. Cat. n.* 4366. *G. Don Syst. Gard. & Bot.* iv. *p* 199.

Pladera pusilla. *Roxb. Fl. Ind.* i. *p.* 403.

Hopea dichotoma. *Vahl. En.* i. *p.* 3.

Exacum sessile. *Willd. Sp. Pl.* i. *p.* 635.

Habitat circa urbem Dehli. *Royle.* ⊙.

As we have before observed, an evident affinity is established between the *Scrophularineæ* and *Gentianeæ* by means of this genus, which comes near to the *Gratioleæ* both in habit and structure, as may be seen by comparing *C. decussata* with *Torenia asiatica.* The *C. pusilla* departs from the rest of the genus by its globular stigmata and by the form of its calyx and corolla, and on these accounts it would seem to constitute the type of a distinct group, to which the name of *Hopea* ought to be restored.

Gen. XI. EXACUM. *Brown.*

Exaci sp. *L.*

Calyx 4-fidus. *Corolla* rotata, 4-fida, marcescens: *tubo* ventricoso. *Stamina* 4, exserta, declinata: *filamenta* teretia: *antheræ* elongatæ, apice ecallosæ, rimâ brevi dehiscentes; *defloratæ* strictæ. *Stylus* declinatus. *Stigma* indivisum, clavatum. *Capsula* globosa, crustacea, 2-locularis: *valvis* margine introflexis. *Placentæ* 2, spongiosæ, septo completo adnatæ, demùm utrinque liberæ. *Semina* minutissima, scrobiculata.

Herbæ (Indiæ Orient.) *annuæ, erectæ, ramosæ, foliis oppositis subsessilibus 3—5-nerviis, floribus axillaribus terminalibusque luteis v. purpureis.*

1. *E. pedunculatum,* diffusum; foliis petiolatis oblongis 3-nerviis, calycibus tubum corollæ subæquantibus.

Exacum pedunculatum. *Linn. Sp. Pl. p.* 163. *Willd. Sp. Pl.* i. *p.* 634. *Wall. Cat. n.* 4359.

Habitat in Indiâ orientali ad Nourungabad. ⊙.

2. *E. tetragonum,* strictum; foliis subamplexicaulibus ovato-lanceolatis acutis 5-nerviis, floribus 4-fidis, calycibus corollæ tubo multò longioribus, genitalibus declinatis.

Exacum tetragonum. *Roxb. Fl. Ind.* i. *p.* 398. *Wall. Cat. n.* 4356.

β. *roseum,* foliis parùm angustioribus, floribus roseis.

Exacum roseum. *Royle Ill. p.* 276.

E. tetragonum. *Don Prodr. Fl. Nep. p.* 128.

E. Hamiltonii. *G. Don Syst. Gard. & Bot.* iv. *p.* 213.

Habitat in Emodi montibus ad Khiree Pass et Kedarkanta. *Royle.* ⊙. Fl. Junio et Augusto.

Gen. XII. SLEVOGTIA. *Reichenb.*

Adenema. *G. Don.*

Gentianæ sp. *L.*

Exaci sp. *Willd.*

Calyx tubulosus, 5-dentatus. *Corolla* infundibuliformis: *limbo* 5-fido, æstîvatione induplicatâ, subvalvatâ! *Stamina* 5, inclusa: *filamenta* subulata, basi interiore squamulâ cyathiformi aucta! *antheræ* lineares apiculatæ: *loculis* parallelis, omninò connatis, longitudinalitèr dehiscentibus. *Stigma* capitatum, indivisum. *Capsula* ovata, crustacea, 1-locularis: *valvis* margine introflexis, placentiferis. *Semina* minuta, globosa, scrobiculata.

Herbæ (Indiæ Orient.) *perennis, radice repenti sublignosâ, caulibus erectis tetragonis simplicibus, foliis sessilibus lineari-lanceolatis acutis 3-nerviis, floribus axillaribus sessilibus parvis albis.*

1. S. verticillata.

Adenema hyssopifolium. *G. Don Syst. Gard. & Bot.* iv. *p.* 201.

Gentiana verticillata. *Linn. fil. Suppl. p.* 174. *Wall. Cat. n.* 4396.

Exacum hyssopifolium. *Willd. Sp. Pl.* i. *p.* 640.

Habitat in ripis Jumnæ fluminis. *Royle.* ♃.

An abstract of the present paper appeared in the Philosophical Magazine for January 1836, and the nomenclature there given is here adopted. I have added the synonyms from the forthcoming volume of my brother's work.

XXX. *Observations on the* Esula Major Germanica *of Lobel.*

By EDWARD FORSTER, *Esq., V.P.L.S. F.R.S.*

Read November 1st, 1836.

THE rediscovery of plants mentioned by ancient authors as natives of this kingdom, but long since forgotten, must be interesting to all who delight in herbarization. It will be well, therefore, to call the attention of the Linnean Society to the fact that the *Euphorbia* lately discovered near Bath by Mr. E. Simms and Dr. Heneage Gibbes, and brought into notice by Mr. Babington, was found in Great Britain, two hundred and sixty years ago, in the same neighbourhood, and probably by the side of the very same wood where it was observed by the botanists above mentioned.

In July 1634, Thomas Johnson, afterwards Lieutenant-Colonel of King Charles's forces and Honorary Doctor of Medicine in the University of Oxford, author of many works on natural history, but best known by his excellent edition of Gerard's Herbal, accompanied by several medical friends from London, undertook a botanical excursion to Bath and Bristol, and from thence to Salisbury, Southampton and Chichester, meeting the party at Marlborough, as he had already been two months at Bath in attendance on a female patient. On his return he published the result of their twelve days' peregrination under the title of *Mercurius Botanicus*. In this little book he records *Esula major Germanica*, Ad. Lob., Ger.; *Tithymalus palustris fruticosus*, Cam., Bauh.; Quack-salvers' Turbith; Water Spurge. "By a woodside, some mile south of Bathe." This is copied by Howe in his *Phytologia Britannica*, 1650. In Merrett's *Pinax Rerum Britannicarum* it occurs thus: "By a woodside a mile from Bath, and betwixt Guildford and Godliman, near Compton in a wheat-field by the side of a moor, near Mr. Yalden's house," which is inserted by Dillenius in the *Indiculus Plantarum dubiarum*, at the end of his edition of Ray's Synopsis, 1724. The Bath station is nearly exact as to the places where it now grows, one being south of Bath, the other not far otherwise.

Johnson, however, was not the original discoverer of this rare plant, for Lobel, or more properly Matthias De L'Obel, who was Botanist to King James the First, and had the care of Lord Zouch's garden at Hackney, in his *Stirpium Historia,* mentions *Esula major Germanica, Turbith nigrum et adulterinum*: "Angliæ frequentissima in sylva D. Joannis Coltes, prope Bathoniam;" properly translated by Parkinson in his Herbal, "In a wood belonging to Mr. John Coltes, nigh unto Bath, very plentifully," for the construction of the sentence will not admit of its meaning "frequently found in England." It is very desirable that search be made between Guildford and Godalming, a situation mentioned only in Merrett's bungling *Pinax,* as Ray, perhaps rather too severely, denominates his book.

There can be no doubt of the Spurge found "some mile south of Bathe" being the *Esula major*; for it is hardly possible to suppose that these "*socii itinerantes,*" being eight members of the Apothecaries' Company, could be ignorant of a plant which the Quack-salvers were accused of substituting for the real Turbith. It is to be observed, that Linnæus makes *Esula major* a synonym of his *Euphorbia palustris,* and I think the Bath plant recently found ought to be so considered. In this I am obliged to differ from my friend Babington, who has much merit in elucidating this plant, first in his *Flora Bathoniensis,* under the name of *E. epithymoides*; since in the Supplement to English Botany, and in his useful Observations on several new and imperfectly understood Plants in the Linnean Transactions, referring it to *Euphorbia pilosa*; in which he is perfectly justified, for it corresponds exactly with the specimen received by Linnæus from Gmelin, so named in the herbarium, but which, I believe, is not distinct from his *E. palustris,* thus described in *Fl. Suecica*:

"*Radix* perennis. *Caulis* annuus. *Folia* lanceolata, alterna. *Umbella* universalis multifida, polyphylla; partiales trifidæ, triphyllæ; reliquæ dichotomæ diphyllæ. *Involucra* et *involucella* ovata. *Fructus* verrucosus. *Flores* primores masculi pentapetali abortientes; secundarii hermaphroditi tetrapetali. *Petala* integra." In the *Species Plantarum, Euphorbia pilosa,* a native of Siberia, is introduced and described: "Habitus exacte *E. palustris,* ut facile pro eadem sumeretur, eodemque tempore floret, paulo tamen major. *Folia* lato-lanceolata, alterna utrinque vix manifeste pilosa, apice ita tenuis-

sime serrata, ut vix observentur serraturæ. *Umbellæ* cum umbellulis lateralibus ita coacervatæ, ut primaria difficilius eruatur, luteæ petalis et involucris. *Flores* primarii masculi pentapetali; reliqui hermaphroditi tetrapetali: petalis transverse ovalibus. *Fructus* verrucosi et pilis albis subtilissimis adspersi. *Rami* steriles ex alis foliorum inferiorum, ut ex summis alis pedunculi umbelluliferi." In these two descriptions there is little difference, except that in *E. palustris* nothing is said of the leaves being hairy or serrated. In *Hortus Cliffortianus,* Linnæus joins to *E. palustris, Tithymalus palustris villosus mollior erectus* and *Tithymalus nemorosus villosus mollior,* Barr. Rar. Whether these belong to it or not, it proves that he did not consider the smoothness of the leaves essential. Perhaps the greatest difference is in one being placed in the division of quinquefid umbels and the other among the multifid; but this will not hold good, for "Umbellæ cum umbellulis lateralibus ita coarcervatæ ut primaria difficilius eruatur" might with great accuracy be applied to *Euphorbia amygdaloides,* our common Wood Spurge, which is placed in the multifid division as well as *E. palustris,* so that *E. pilosa* must come into the same division as that species.

On the 2nd of August last I visited the station nearest to Bath, and though the husbandman had been before me with his hook, I found enough left for examination, and I have a living plant received from thence in a former year. After the most careful attention I can give to the subject, I am thoroughly convinced that the plant now found is the *Euphorbia palustris* of Linnæus and most continental botanists, and that it is also the "*Euphorbia* foliis alternis, ex ovali lanceolatis umbellis diphyllis subtrifloris, capsulis erectis muricatis, caule simplici" of Gmelin in his *Flora Sibirica,* vol. ii. 227. t. 93. "Inter Irtim et Jeniseam fluvios ubique frequens est," which Linnæus has adopted as *E. pilosa.* In the Linnæan Herbarium the specimen called *E. palustris* has glabrous leaves, yet still I think the rudiments of hairs may be traced on some of them. In that marked *E. pilosa,* "Jenise," and therefore evidently sent to Linnæus from the latter of the rivers mentioned by Gmelin, the hairs are very visible and by no means "vix manifeste." In the Banksian Herbarium there is a specimen named *Euphorbia palustris,* "In Austria alpina, *Jacq.,*" which agrees exactly with the *Euphorbia pilosa* of the Linnæan Herbarium, and with our Bath plant in having the leaves manifestly hairy on the margins and

underside, and sometimes on the upper surface; and in Clifford's Herbarium in the same valuable collection, there is a similar specimen, marked also *E. palustris.* The *E. pilosa* of the Banksian Herbarium is a totally different plant, which is accounted for by Dryander in a MS. note in the *Species Plantarum*: "Planta Sibirica Linn. Herb. exacte refert figuram Gmelini, distincta a planta Europæ Australis." My specimens from Bath differ in no respect that I can discover from the Banksian specimens, or from the Siberian one preserved by Linnæus under the name of *E. pilosa,* yet differing from his description of that plant in the manifest hairs, as well as in the serratures, which are frequently very visible, except towards the base; sometimes, indeed, they are inconspicuous from the doubling of the edge of the leaf, but I believe they always exist. In my living plant the leaves on the barren shoots are becoming glabrous; these shoots, aptly described by Haller as loving to rise superior to the umbel, are very remarkable, issuing not only from the stem, but actually from the summits of the umbels, as described in the above quotation from the *Species Plantarum.* These are evidently intended in the figures of the ancient authors, which would otherwise represent the plant very badly; as it is, they are by no means to be praised.

I venture to suggest the following character and synonyms.

EUPHORBIA PALUSTRIS.

E. umbella subquinquefida: trifida: bifida: bracteis ellipticis glabris, foliis lato-lanceolatis subpilosis serrulatis, capsulis verrucosis pilosis.

E. palustris. *Linn. Sp. Pl.* 662? *Jacq. Misc. tom.* ii. 314. *Host. Syn. Aust.* 266. *Banks. et Cliff. Herb.*

E. pilosa. *Linn. Sp. Pl.* 659. *Bab. in Linn. Trans. vol.* xvii. 460. *Engl. Bot. Suppl. vol.* ii. 2787. *Roep. En. Euph.* 63. *Bot. Gall.* 414. *Linn. Herb.*

E. pilosa β. *Hook. Br. Fl. ed.* 3. 388.

E. epithymoides. *Bab. Fl. Bath.* 44. (non *Linn.*).

E. i. *Gmel. Fl. Sib. vol.* ii. 226. *t.* 93.

Tithymalus, 1054. *Hall. Helv. vol.* ii. 11.

Esula major. *Dod. Purg.* 158. *Dalech. Hist. p.* 1653.

Esula major Germanica. *Lob. Stirp. Hist.* 194. *Johns. Merc. Bot.* 34.

Howe, Phyt. 39. *Park.* 188. *f.* 12. *Merr. Pin.* 37. *Dill. Ind. in Raii Syn.* ad finem.

Esula palustris. *Riv. Tetr. Irr. t.* 116.

Tithymalus palustris fruticosus. *Bauh. Pin.* 292.

β. foliis glabris (non in Anglia observatur).

E. palustris. *Linn. Herb.*; *Fl. Suec.* 163.; *Fl. Dan. t.* 866. (mala). *Svensk Botanik, n.* 329. *Roep. En. Euph.* 62. *Bot. Gal.* 414.

Anglis. Water Spurge, Quack-salvers' Turbith.

Habitat in umbrosis prope Bath. *Lobel* et *Johnson*; nuper *D*[r] *Simms* et *Gibbes.*

In the specific character I have left out "ramis sterilibus," though inserted by Linnæus, because barren branches occur in other perennial *Euphorbiæ,* and in *E. emarginata* they assume the same proliferous habit.

In Jacquin's *Observationes Botanicæ* in his *Miscellanea Austriaca, Euphorbia palustris* is very fully described, particularly mentioning the scattered hairs on the stems, the lanceolate-oblong leaves, sharply serrated at the ends, and generally covered with short hairs, yet sometimes smooth on the upper surface, and the capsules warty and hairy. This description, which agrees in every respect with our Bath plant, is abridged in Host's *Synopsis,* still pointing out the hairiness: in the *Svensk Botanik* it is figured quite smooth. It appears probable, therefore, that the variety β grows in Sweden and Denmark, and is not known in Great Britain.

Most authors state the *E. palustris* as growing in wet places; and so does Gmelin with regard to his plant. Yet here, again, there is ancient authority for situations somewhat like ours near Bath: "Reperitur major in collibus quibusdam Germaniæ in apricis circa Staphusiam et Basileam, in Apuliæ quoque Gargano monte, Matthiolo teste." Dodoens, *Purgantium Libri.* Lyte in his translation of Dodoens's Herbal says, "The great *Esula* in some countries groweth in wooddes and wildernes, and in this country in the gardens of herbarists." Nor is modern and better testimony wanting; for in *Jacq. Misc.* it is said to grow "non tantum in paludosis locis demissis sed etiam in Austriæ alpe Etschero crescit:" and in Host's *Syn.* "in palustribus Austriæ, Pannoniæ, et in editissimo Austriæ monte Oetscherberg."

Always maintaining that the modern practice of consolidating the synonyms

of plants which had previously been considered distinct by eminent botanical authors, without marking them with the usual Greek characters, is uncourteous and tending to great confusion, I insert the *E. palustris* of the Linnæan Herbarium as a variety. I am not sufficiently acquainted with *E. procera* and *villosa* to be able to judge whether they should also be so considered.

The restoration of this Spurge to a place in the British Flora fully vindicates the accuracy of Lobel, who has been accused of noting plants as English on insufficient authority. He perhaps discovered it when on a visit to his friend Edward Saint Loo, who resided in Somersetshire, and was much attached to the study of botany. That it has a right to be so ranked, after an abode of nearly three centuries, the most sceptical must allow, even though it might have escaped from the neighbouring grounds of the Prior of Bath, or from the physic gardens of the herbarists of that city.

XXXI. *Notice respecting a Native British Rose, first described in* RAY'S *Synopsis, as discovered by* JAMES SHERARD. *By* JOSEPH SABINE, *Esq., F.R.S. & L.S., &c.*

Read June 21st, 1836.

IF the adding to the British Flora a new plant is a great delight to an English botanist, the finding and making out one, the existence of which has been long involved in doubt, is not less agreeable. The subject of the present communication is of the latter description.

In the Addenda, page 478, to the third edition of Ray's Synopsis of British Plants, published in 1724, is the following description of a native English Rose: "Rosa sylvestris folio molliter hirsuto, fructu rotundo glabro, calyce et pediculo hispidis. Diversa species videtur a Rosa sylvestri fructu majore hispido D. Dale (p. 454.) ceu quæ vulgari propius accedit, in hac vero specie folia molli hirsutie pubescunt, fructus rotundus glaber est, verum calyces et pediculi crebris spinulis brevibus obsiti sunt. Ceterum fructus umbellatim nascitur, et calyx non decidit in hac specie: pediculi modice longi sunt. Found by Mr. J. Sherard a little on this side Kingston by the Thames."

The Rose with which Sherard's plant is compared is thus described at page 454 of the work referred to: "Rosa sylvestris fructu majore hispido. Wild Briar or Dogs Rose with large prickly Heps. In sepibus non infrequens a D. Dale observata. Calyx in hac specie non decidit postquam fructus maturuit quemadmodum in præcedente, sed ei pertinaciter adhæret." Hudson (*Flora Anglica,* edit. alt. p. 219,) has made this Rose the variety β of his *R. villosa,* very accurately distinguishing it. His *Rosa villosa* α, which he refers to Ray's "*Rosa sylvestris pomifera major nostras,*" in my opinion is the *Rosa villosa* of Woods*, whilst the variety β belongs, as I conceive, to *Rosa tomentosa*

* I am aware that Mr. Woods refers the "Rosa sylvestris pomifera major nostras" of Ray to his *Rosa tomentosa*; but though I venture, notwithstanding the great authority of my friend, to differ with him on this point, I do so with diffidence, for I must ever consider him as my best instructor on the subject of British Roses, and as the first botanist whose inquiries led to a good understanding of the genus.

of the same author. The former is very correctly stated by Hudson as growing in the North of England, whilst the latter he says grows plentifully about London. The experience of subsequent botanists has confirmed the correctness of these locations, for the *R. villosa* of Woods does not exist in the South of England, but his *R. tomentosa* grows not only in the South, but in one or other of its various forms is found in almost every part of Great Britain.

Sir James Smith in the second volume of his English Flora, which contains the genus *Rosa,* has united and made a distinct species of the varieties ε and η of Woods's *Rosa tomentosa,* calling it *Rosa subglobosa,* and to this he refers Sherard's Rose, the description of which is extracted above from Ray. Sir James Smith at first had called the species *Rosa Sherardi,* but subsequently changed its designation.

It is not part of my present object to discuss the question, whether the above two plants described by Mr. Woods as varieties of *Rosa tomentosa* can with propriety be separated from that species, as is proposed in the English Flora; I will therefore only briefly state my doubts on the subject. I have not seen living plants of the variety ε, but I suspect, from the different habitats given to it, that different plants have been confounded together as one. As regards the variety η, I once searched for and found that growing in the locality mentioned by Mr. Woods near Potter's Bar, and subsequently having cultivated it, can pronounce decidedly that it is referable only to *Rosa tomentosa* of Woods, of which it is a remarkable variety.

The description of Sherard's Rose certainly led to the supposition that it was a round smooth-fruited plant, having some affinity to the *Rosa villosa* of Hudson and Woods, but especially distinguishable from it by the shape of the hip. Being satisfied that nothing but an inspection of the actual plant would set the question respecting it at rest, I caused some years since a strict search to be made amongst the wild Roses in the vicinity of Kingston, and though by this I obtained some very curious plants, I got nothing at all resembling that I sought for. The discovery was reserved for myself.

Four or five years back I found several plants of a Rose belonging to Mr. Woods's setigerous section growing in a hedge a short distance from Kingston. The plants in the hedge were so ill treated and cut about, that I was disappointed in procuring flowers from them; none were produced. I

therefore removed some suckers into the garden of my friend Mr. Robert Jenkinson, at Norbiton in the neighbourhood, where they have blossomed in the present year. The plant turns out to be a variety of *Rosa Doniana,* exactly corresponding with that from Sussex, given by Mr. Borrer in the Supplement to English Botany, folio 2601, except that the fruit is smooth, though the calyx and peduncles are beset with small spines. It agrees exactly in every point with the description above quoted from Ray, and therefore I have no doubt that it is the Rose found by Sherard, and probably existing in the identical locality where he discovered it. This is in the hedge of the first field on the right side of the high road from London, in descending Kingston Hill, after passing the George Inn.

The description in Ray of this Rose is imperfect: had it been stated that the fruit was small as well as globose, and that the branches bore both setæ and aculei, there would have been little difficulty in assigning to it its proper place in the genus; and as in the time of Hudson, and indeed until a much later period, *Rosa spinosissima* was the only species of the setigerous section described by British botanists, it would probably have been referred to that. In the present day we have a transition of species from *R. spinosissima* through *R. rubella*, *R. involuta*, *R. Doniana*, and *R. Sabini,* all belonging to the setigerous Roses, and in the last species approaching to *R. tomentosa* of the next section, which contains the species having straight aculei but without setæ.

XXXII. *Descriptions of some new Species of* DIOPSIS. *By* J. O. WESTWOOD, *Esq., F.L.S., &c.*

Read November 3rd, 1835.

HAVING since the publication of my monograph upon the Dipterous genus *Diopsis* in the 2nd part of the 17th volume of the Transactions of the Linnean Society, met with some new species of that remarkable genus in several of the Continental cabinets which I have recently examined, I beg leave to offer the descriptions of them to the Linnean Society by way of supplement to my monograph.

Species ad Sectionem primam pertinentes.

Species 22. (vel 1*a*.). DIOPSIS WIEDEMANNI, *mihi.*

TAB. XXVIII. Fig. 1.

D. capite medioque abdominis rufescentibus, thorace nigro, spinis 2 scutellaribus et 4 thoracicis flavidis, alis fuscescentibus in medio obscurioribus maculâ ante apicem sublunari.

Long. corp. lin. 4.

Habitat in Guineâ Africæ. In Mus. Wiedemann.

Magnitudine et affinitate *D. Ichneumoneæ* proxima, à quâ autem differt alis fuscescentibus, abdominis basi nigrâ thoraceque 4-spinoso. E pedunculis oculiferis abdomineque haud clavato insectum masculinum indicatur.

Caput rubrum, os versus attenuatum, et utrinque spinâ acutâ perpendiculari armatum, pedunculi oculiferi graciles, thorace paullò longiores. *Thorax* niger, collari nitido, scutelloque concolori; *spinæ* 2 scutellares elongatæ, 2 mesothoracicæ et 2 metathoracicæ abbreviatæ, flavæ. *Abdomen* elongatum haud clavatum, sensim ultra medium latius, basi nigrâ, medio rufo apiceque rufescenti-fusco. *Pedes* rufescentes, femoribus anticis incrassatis, posticis 4, ad apicem 1-subspinosis; *tibiis* anticis subtùs obscurioribus.

Alæ fuscescentes, colore fuscescenti in medio alarum nervum versus furcatum paullò obscuriori, maculâque magnâ fuscâ sublunari, internè productâ posticèque ad apicem alæ extensâ inde apex se ipse quasi maculâ albâ rotundatâ notatus videtur.

Species 23. (vel 1 *b*.). DIOPSIS ERYTHROCEPHALA. *Klug MSS.*

TAB. XXVIII. Fig. 2.

D. capite lætè ochraceo, pedunculis oculiferis obscurioribus, thorace nigro, pedibus anticis pallidè luteis, tibiis tarsisque fuscis, alis pallidè fuscescentibus, maculâ ante apicem transversâ.

Long. corp. lin. $3\frac{1}{4}$. Expans. alar. lin. $5\frac{1}{2}$.

Habitat ad Promontorium Bonæ Spei. *D. Lichtenstein.* In Mus. Reg. Berolinensi.

Differt à *D. Ichneumoneâ* et *Wiedemanni* staturâ minore, pedunculis oculiferis brevioribus, et loco natali.

Caput lætè ochraceum, os versus attenuatum ibique in spinis duabus perpendicularibus lateralibus productum. *Pedunculi* oculiferi thorace breviores, obscuriores, spinis ordinariis armati. *Antennæ* fulvæ. *Thorax* niger sericeus, collari scutelloque concoloribus. *Spinæ* scutellares speciminis unici in Musæo Berolinensi conservati deteritæ. *Abdomen* elongatum haud clavatum (itaque sexum masculinum indicatur, quamvis e brevitate pedunculorum oculiferorum insectum sexus fœminei putares), obscurè fulvescens, dimidio basali obscuriori, apiceque etiam paullò obscuriori. *Alæ* pallidè fuscescentes, maculâ ante apicem transversâ notatæ. *Pedes* antici pallidè luteo-flavi, femoribus incrassatis tibiis tarsisque fuscis, pedes intermedii omninò luteo-flavi, postici luteo-fuscescentes, femorum tibiarumque basibus flavis, femoribus 4 posticis ad apicem 1-spinosis.

Species 24. (vel 2 *a*.). DIOPSIS ARABICA, *mihi.*

TAB. XXVIII. Fig. 3.

D. capite pallidè fulvo, pedunculis oculiferis obscurioribus, thorace nigro, collari luteo-fulvescenti, tibiis anticis posticisque fuscescentibus.

Long. corp. lin. 3.

Habitat in Arabiâ desertâ. *D. Ehrenberg.* In Mus. Reg. Berolinensi.

Statura omninò *D. erythrocephalæ*; *D. collari* etiam valdè affinis. *Caput* lætè pallidè fulvum, pedunculis oculiferis paullò obscurioribus, et ad oculos fuscis. *Antennæ* pallidæ. *Collare* luteo-fulvum. *Thorax* sericeo-niger, scutello concolori. *Spinæ* 4 thoracicæ sordidè luteæ. *Abdomen* omninò pallidè luteum. *Pedes* abdomine concolores, femoribus posticis ad apicem 1-spinosis. *Tibiæ anticæ* cum *tarsis* pallidè fuscæ, tibiæque posticæ ejusdem coloris, basi ipso luteo. *Alæ* maculâ subquadratâ ante apicem, versus costam obscuriori.

Species 4. Diopsis nigra. *Illiger.*

Vide Monogr. nostr. p. 297.

Tab. XXVIII. Fig. 4.

In Musæo Regio Berolinensi individuum hujus speciei hospitatur, indè figuram annexam et addenda specifica sequentia obtinui.

Long. corp. lin. 2¾. Expans. alar. lin. 5.

Habitat apud Sierram Leonam.

Caput nigro-piceum, ad os bispinosum, pedunculis oculiferis thoracis longitudine, fuscis, ad apicem nigris. *Thorax* niger, sericie subargenteâ indutus; *collari* nitido piceo-nigro; *spinæ scutellares* sordidè fuscæ. *Abdomen* piceo-nigrum, nitidissimum, subclavatum. *Pedes* picei.

Species ad Sectionem 2am pertinentes.

Species 6. Diopsis tenuipes, *mihi.*

Vide Monogr. nostr. p. 298.

Tab. XXVIII. Fig. 5.

In Musæo Regio Berolinensi individuum è Senegalliâ à Dom. Bucquet communicatum etiam hospitatur, quod è formâ corporis evidentèr ad sexum fœmineum hujus speciei esse referendum, subindè diversitas specifica, de quâ anteà dubitavi, confirmetur.

Long. corp. lin 3½. Expans. alar. lin. 6.

Habitat in Senegalliâ. *D. Bucquet.* In Mus. Reg. Berol.

D. tenuipede ♂. Tab. nostr. IX. fig. 5. major et multò robustior quamvis coloribus simillima. *Caput* cum cornubus oculiferis, et antennis fulvis, cornuum apicibus oculisque nigricantibus; *spinæ* ordinariæ cornuum femorumque posticorum valdè distinctæ. *Spinæ scutellares* fulvæ, apicibus nigris. *Abdomen* latum, depressum, omninò testaceo-fulvum; *alæ* in medio infuscatæ, apicibus fuscis. *Thorax* niger, sericeus. *Femora antica* tantùm paullò incrassata. *Pedes* omnes fulvi, tibiis anticis tibiarumque posticarum apicibus fuscescentibus.

Obs. Pedunculi oculiferi in insecto suprà descripto quàm in ♂ vix breviores sunt.

Species 25. (vel 10*a*.). Diopsis Trentepohlii. *Westerm.*

Tab. XXVIII. Fig. 6.

D. capite thorace spinisque scutellaribus nigris, pedunculis oculiferis fuscis; abdomine obscurè ferrugineo, nitido, basi nigricante; pedibus rufescentibus, tibiis anticis et posticis fuscis ♀.

Long. corp. ♀ lin. 3½. Expans. alar. lin. 6.

Habitat in Guineâ. In Mus. nostr. Comm. Dom. Westermann cum nomine inedito *Diopsis Trentepohlii*.

Descr. Affinis *D. fumipenni*, major tamen et multò robustior, colore obscuriori pedibusque (præsertìm tibiis duabus posticis) diversè coloratis. *Caput* nigrum facie anticè attenuatâ et in spinam perpendicularem utrinque productâ; *pedunculi oculiferi* circiter longitudine capitis cum thorace, fusci, spinis 4 ordinariis brevibus. *Antennæ* luteo-fuscæ, setâ apicali longissimâ. *Thorax* niger, nitidus; *scutello* concolore, opaco; *spinis scutellaribus* thoracis longitudine, acutissimis, ferè rectis, nigris; *spinis metathoracicis* brevibus nigris. *Femora antica* fulva, subincrassata, intùs serie spinarum parvarum armata; *tibiæ anticæ* fuscæ, *tarsi* fusci, subtùs aureo-tomentosi; *pedes intermedii* fulvescentes; *femora postica* fulva, *tibiæ* fuscæ; *tarsi* fusci basi pallidiores et subtùs aureo-pilosi; femora 4 postica, apicibus unispinosis. *Alæ* in medio nubilâ magnâ fuscâ, dimidium alæ ferè occupanti, nubilâ alterâ pallidiori basin versus internum alæ, apiceque maculâ magnâ fuscâ. *Abdomen* magnum, clavatum, subdepressum, obscurè castaneo-ferrugineum subnitidum, basi apiceque nigricantibus.

Species ad Sectionem 3am pertinentes.

Species 26. (vel 16*a*.). Diopsis atricapillus. *Guérin.*

Tab. XXVIII. Fig. 7.

D. capite thoraceque nigris, pedunculis oculiferis thorace longioribus, fuscis; abdomine elongato vix clavato, fulvo; pedibus fulvis, femoribus anticis haud dilatatis; alis hyalinis immaculatis, apice vix vel tenuissimè infumato; femoribus 4 posticis ad apicem inermibus.

Long. corp. ferè 3 lin.

Habitat —— ?

Diopsis atricapillus. *Guérin Icon. Règne An. Ins. pl.* 103. fig. 7. (descriptione nondum editâ).

Species (?) 27. Diopsis longicornis. *Macquart.*

D. "d'un fauve rougeâtre. Face à ligne transversale brune. Dilatations du front longues de 2½ lignes. Yeux noirs. Thorax noir, écusson et pointes sous les ailes fauves. Premier segment de l'abdomen noirâtre. Cuisses antérieures non renflées. Ailes un peu brunâtres. ♂."

Long. corp. 3½ lin.

Habitat in Guineâ et Senegalliâ.

Diopsis longicornis. *Macquart Hist. Nat. Ins. Dipt. vol.* ii. *p.* 486.

An verè distincta à *D. thoracicâ* Monogr. p. 306. ?

Species ad Sectionem 4am pertinentes.

Species 19. Diopsis Dalmanni. *Wied.*

Tab. XXVIII. Fig. 8.

Vide Monogr. nostr. p. 309.

Individuum hujus speciei elegantissimæ à Dom. Westermanno accepi et figuram ejus ad naturam delineavi, figurâ Wiedemanni vix sufficienti. Ab omnibus speciebus adhuc cognitis differt colore fulvo-ferrugineo. In specimine colorem flavum (gelbe) haud detegere possum. *Spinæ scutellares* deteritæ. *Corpus* et *pedes* magìs pilosa quàm in congeneribus.

Spinæ centrales ordinariæ pedunculorum oculiferorum in setam longam producuntur. *Pedes* fulvo-ferruginosi; tibiis anticis et posticis obscurioribus.

Species 28. (vel 19*a*.). Diopsis Miegenii (*Wiedemann MSS.*).

Tab. XXVIII. Fig. 9. ♂. Fig. 10. ♀.

D. nigra, pedunculis oculiferis, spinisque scutellaribus fuscis; abdomine ad basin fasciis duabus (posticâ interruptâ) argenteis; alis maculâ parvâ centrali fasciâque angustâ fuscescentibus.

Long. corp. lin. $2\frac{3}{4}$—$3\frac{1}{4}$. Expans. alar. lin. $4\frac{1}{4}$—5.

Habitat in Guineâ Africæ. In Mus. Regio Berolinensi et Wiedemanni. Etiam in Mus. nostr. ♂. ♀. Amicissimè communicavit Dom. Westermann.

Species elegans, *D. Sykesii* affinis, alis minùs fasciatis. *Caput* atrum, pedunculis oculiferis fuscis. *Thorax* niger, collari scutelloque concoloribus, spinis scutellaribus 2 et 2 metathoracicis fuscis. *Abdomen* nigrum, sericeum, basi atrum fasciâ parvâ subconoideâ basin versus maculisque duabus (in medio abdominis) lateralibus triangularibus sericeo-albis. *Alæ* hyalinæ maculâ parvâ centrali, fasciâque tenui transversâ pone medium, apiceque ipso tenui pallidè fulvo-fuscescentibus. *Femora antica* paullò incrassata, postica ad apicem haud spinifera.

Obs. Individua nonnulla (♀) abdomen habent clavatum et pedunculos oculiferos thorace longiores. In aliis verò (♂) abdomen est gracilius, ferè lineare, pedunculis oculiferis paullò brevioribus.

Species 29. (vel 19*b*.). Diopsis Neesii, *mihi*.

Tab. XXVIII. Fig. 11.

D. capite rufescenti; thorace obscurè nigricanti; scutello pallidiori; abdominis basi rufo, apiceque nigro; alis 3-fasciatis.

Long. corp. lin. $2\frac{3}{4}$. Expans. alar. lin. $4\frac{1}{2}$.

Habitat ——? Japoniâ? In Mus. Academiæ Bonnensis.

Corpus pilis adspersis tectum. *Caput* fusco-rufescens, nitidum, ad os haud bispinosum. *Pedunculi oculiferi* ad apicem obscuriores, thorace longiores,

graciles. *Thorax* cum spinis scutellaribus (arcuatis) et metathoracicis, piceo-niger. *Scutellum* sordidè albido-fuscescens. *Abdomen* dimidio basali fusco-rufescenti, parte posticâ obscuriori, vel piceo. *Alæ* hyalinæ, fasciâ tenui basin versus, 2dâ latissimâ centrali, et 3tiâ tenuiori externè curvatâ, apicem versus alarum fuscis. *Pedes* fusco-rufescentes, femoribus anticis paullò incrassatis, posticis ad apicem inermibus, pedibus posticis nisi ad basin femorum paullò obscurioribus.

Species 30. (vel 19*c*.). Diopsis ornata, *mihi*.

Tab. XXVIII. Fig. 12.

D. atra, capite abdomine pedibusque piceo-nigricantibus, oculis ferrugineis pedunculis oculiferis capite paullò longioribus, femoribus anticis dilatatis, posticis quatuor ad apicem spiniferis; abdomine dilatato clavato; alis 4-fasciatis, fasciâ 1mâ angustâ et ad partem 3am longitudinis alarum sitâ, 2dâ latissimâ medium alarum occupanti; 3tiâ angustâ et 4tâ apicali.

Long. corp. 3 lin.

Habitat ——?

Diopsis fasciata. *Guérin Icon. Règne An. Ins. pl.* 103. *fig*. 8. (descriptione nondum editâ).

I have been obliged to give a new specific name to this insect, in order that it may not be confounded with the *D. fasciata* of my monograph.

Species 31. (vel 19*d*.). Diopsis circularis.

Tab. XXVIII. Fig. 13.

D. "Noir; dilatations du front brunes. Genoux et tarses anterieurs et intermediaires fauves. Ailes à grand tache discoïdale brune arrondie, entournée d'un cercle hyalin.

Long. corp. 3½ lin.

Habitat in Indiâ orient.

Diopsis circularis. *Macquart Hist. Nat. Ins. Dipt. vol.* ii. *p*. 486.

With reference to the geographical range of this genus, the species above described prove, as already surmised, that it is confined to the Old World,

whilst the discovery of species at the Cape of Good Hope and Arabia will be deemed very interesting, considering that hitherto the western coast of Tropical Africa and the East Indies have alone supplied the species already described.

In conclusion, I must beg leave to express my thanks to Messrs. Wiedemann of Kiel, Klug of Berlin, and Goldfuss of Bonn, for the kindness and liberality with which they permitted me to make the most unbounded use of the celebrated cabinets over which, with so much honour to themselves and such advantage to science, they preside; and also to M. Westermann of Copenhagen, who has been so kind as to send me specimens of several species of this very rare genus.

Westwood del.

W. Gauci lith.

XXXIII. *On the Identity of three supposed Genera of Orchideous Epiphytes. In a Letter to* A. B. LAMBERT, *Esq., V.P.L.S. By Mr.* ROBERT H. SCHOMBURGK.

Read November 15th, 1836.

IN a letter which I had the pleasure to address to Mr. Bentham, on the 28th of June last year, I informed him of a remarkable Orchideous plant, from appearance a *Monachanthus*, which on one side of the bulb produced a scape with six flowers of *Monachanthus viridis*, and two of the *Myanthus barbatus*, while a second scape of the same bulb had twenty-five blossoms of the *Myanthus barbatus.* This plant was in possession of Mr. Reiss, who, when both scapes were in full flower, took the accompanying drawing (TAB. XXIX.) of it, and preserved the stem with the flowers of *Monachanthus viridis* and *Myanthus barbatus* in spirits, which I have likewise the pleasure to send herewith, and beg you to present it in my name to the Linnean Society.

If the circumstance of a bulb of the *Monachanthus* producing conjointly the flowers of its own genus and *Myanthus* had occurred only in this instance, it might be considered one of those freaks of Nature which not unfrequently occur; but the case just quoted is not singular, and has been observed at least once more in a collection of Orchideous plants belonging to a lady, where the same species of *Monachanthus* produced also flowers of the *Myanthus barbatus.*

The thought impresses itself, therefore, forcibly upon me, that the genera *Monachanthus, Myanthus,* and *Catasetum* form but one genus, and in this conclusion I am borne out by the following observations.

A vigorous plant, which produced at its former state of inflorescence the flowers of *Monochanthus viridis,* had two months ago a scape with flowers of *Catasetum tridentatum*; this occurred at Mr. Wortman's collection at Canal, No. 1.

Mr. Bach, an enthusiastic collector of Orchideous plants, sowed the seed

of *Monachanthus viridis* on a decayed trunk of an *Erythrina.* Among these plants, one produced a scape with the flowers of *Catasetum tridentatum*: this I saw myself: the bulb was young, but the flowers in every respect quite perfect.

Here we have traces of sexual difference in Orchideous flowers. I have seen hundreds of *Catasetum tridentatum* on savannahs adjacent to the lake Capoeya (Arabisce coast of Essequebo), without ever finding one specimen with seeds, while those bulbs which, according to Dr. Lindley's description, belonged to *Monachanthus viridis,* astonished me by their gigantic seed-vessels.

Mr. Bach raised from the seeds of *Monachanthus viridis* a plant of *Catasetum,* and I have observed individually scapes which bore flowers of both genera, while the evidence of the present plant, which has caused these remarks, would likewise include the genus *Myanthus* in the group. Dr. Lindley appears to have been prepared for the latter discovery in his Genera and Species of Orchideous Plants, part iii. p. 155. In his diagnosis of *Myanthus,* he says "anthera et pollinia *Cataseti*;" and further on, "*Catasetum cristatum* is intermediate between this genus and *Catasetum*:" but I doubt whether he ever conjectured the near relationship between *Monachanthus* and *Myanthus,* and the terms "labellum posticum" and "anticum" will be hereafter of less value as generic differences.

Demerara, August 15, 1836.

XXXIV. *Extracts from the* MINUTE-BOOK *of the* LINNEAN SOCIETY *of* LONDON.

1832.

March 20. READ a Description of a new Species of Parrakeet from New Holland. By Mr. Lionel Dietrichsen, F.L.S. This new species belongs to the genus *Trichoglossus* of Vigors, and the following are its character and description:

T. PORPHYROCEPHALUS. Front yellow. Crown purple. Neck, back, wings and tail green. Throat, breast and belly French grey. Shoulders blue. Nuchal collar pale yellow-brown.

Front yellow, getting red, and becoming broader as it approaches the region of the eyes; ears yellow; crown purple; back of the neck light yellow-green, which colour is separated from the darker green of the back by a broad nuchal collar of pale yellow-brown, which extends beyond the top of the wings to the sides of the breast; the back wing-coverts and exterior shafts of the wing- and tail-feathers green; throat, breast, and belly pale French grey; the feathers of the sides yellow, which colour is also observable on the under tail-coverts; shoulders bright blue; under wing-coverts scarlet; interior webs of the tail-feathers yellow, of the quills black.

Wings pointed; first and second quills equal and longest, reaching half the length of the tail; tail acuminated; legs short; tarsi slender, reticulated; beak much arched, black, the under mandible obscured by setaceous feathers, extending forward.

Length 7 inches; wings from the carpal joint, 4 inches; middle tail-feathers, from insertion to tip, $2\frac{3}{4}$ inches; lateral 2 inches; beak $\frac{1}{2}$ an inch; tarsi $\frac{3}{8}$ths of an inch.

May 1. The Secretary read a letter addressed to the President by H. S. Foljambe, Esq. F.L.S., giving an account of the *Falco rufipes* of Bechstein, having been shot near Doncaster in April 1830. Three

other individuals of this Falcon were killed in Norfolk in the same year.

Nov. 6. The Vice-President in the chair, announced the magnificent donation which the Court of Directors of the Honourable East India Company had made in presenting to the Society the whole of the extensive herbaria at the India House, comprising nearly 8000 species, collected by König, Röttler, Roxburgh, Heyne, Wallich, Wight, and other distinguished naturalists in the Company's service, during a series of years in India.

The following subscription was entered into for the purpose of supplying cabinets, &c. for the above-mentioned collections.

	£.	*s.*	*d.*
A. B. Lambert, Esq.	10	0	0
Dr. Maton	10	0	0
Robert Brown, Esq.	10	0	0
Edward Forster, Esq.	10	0	0
Dr. Wallich	10	0	0
Dr. Hooker	10	0	0
George Bentham, Esq.	10	0	0
Richard Taylor, Esq.	5	0	0
Dr. Boott	5	0	0
Major-General Hardwicke	10	0	0
Dr. Lindley	5	0	0
Davies Gilbert, Esq.	10	0	0
Arthur Aikin, Esq.	5	0	0
W. J. Burchell, Esq.	10	0	0
L. H. Petit, Esq.	10	0	0
G. A. W. Arnott, Esq.	5	0	0
Dr. Graham	10	0	0
Charles Lyell, Esq.	8	0	0
Charles Lyell, jun., Esq.	2	0	0
Dr. Greville	5	0	0
R. H. Solly, Esq.	10	0	0
John Reeves, Esq.	10	0	0
	£180	0	0

	£.	s.	d.
Brought forward	180	0	0
His Grace the Duke of Bedford	10	10	0
Joseph Neeld, Esq.	10	0	0
The Rev. Thomas Gisborne	10	0	0
The Provost of Eton	10	0	0
Henry Beaufoy, Esq.	5	0	0
Lieut.-Colonel W. H. Sykes	5	0	0
N. B. Ward, Esq.	5	0	0
Dr. Williams	10	0	0
His Grace the Duke of Somerset	20	0	0
William Borrer, Esq.	5	0	0
Dr. Lee	2	0	0
The Rev. Mr. Yates	2	0	0
Richard Simmons, Esq.	10	0	0
Dr. Hull	5	0	0
William Valentine, Esq.	1	0	0
R. I. Murchison, Esq.	5	5	0
Mr. Anderson	1	0	0
Charles Stokes, Esq.	5	0	0
William Horton Lloyd, Esq.	5	0	0
Dr. Holme	3	19	0
John Guillemard, Esq.	5	0	0
	£315	14	0

Dec. 4. Read an account of a species of Thrush killed at Heron Court, Hants, in January 1828, by the Hon. Charles A. Harris, communicated by J. Curtis, Esq. F.L.S. Mr. Yarrell, in a letter accompanying the communication, considered the bird to be identical with the *Turdus varius* of Horsfield, a native of the Indian Islands and New Holland. The specimen shot was in perfect plumage, and had no appearance of ever having been in confinement. Mr. Yarrell is disposed to think the species may be also a native of Africa, which if confirmed would account for its appearance in England.

1833.

March 5. The President exhibited an Irish Hare, as distinct from the English species.

March 19. A Letter addressed to the Secretary from Charles Stokes, Esq. F.L.S. was read, on the discovery of milk in the mammæ of the *Ornithorhynchus* of New Holland, by J. M'Arthur, Esq. of Parramatta. Communicated by Captain King, R.N., F.L.S.

April 2. The Secretary announced that Mrs. Dickson had presented to the Society the Botanical collections of her late husband James Dickson, Esq. F.L.S.

1834.

March 4. Read a Description of a new species of *Geaster*. In a letter addressed to the Secretary. By Mr. Robert H. Schomburgk.

G. Donovani. Outer peridium 6- or 8-cleft; lobes lanceolate, acute, unequal, recurved; inner peridium sessile, sphærical, the mouth conical, plaited, fringed at the margin.

Found by Mr. Schomburgk in a grove of trees near St. Bernard's in the Island of Tortola, and named by him after Dr. Donovan of that island. This Fungus is met with in the months of November and December.

A Specimen of *Nanodes undulatus* in the adult plumage was exhibited by Mr. William Tucker, being the first of the kind that had reached Europe.

The bird described in the 15th volume of the Society's Transactions, and figured in the 2nd volume of Latham's General History of Birds, being in the immature plumage, and differing from the adult specimen in wanting "the round shot-like drops" on the throat, and in the less brilliance and beauty of the whole plumage.

April 15, & *May* 6. A paper was read, containing "Observations on some Species of Native Mammalia, Birds and Fishes, including additions to the British Fauna." By William Thompson, Esq. Communicated by the Secretary.

The author commenced by stating, that a perusal of the Rev. Mr. Jenyns's paper, entitled, "Some Observations on the Common Bat of Pennant, with an attempt to prove its identity with the *Pi-*

pistrelle of French authors" (Linn. Trans. vol. 16.), induced him to examine specimens of the common Bat of the North of Ireland; which hitherto, like that of England, up to the period of Mr. Jenyns's paper, has been considered the *Vespertilio murinus* of Linnæus, as well as of recent continental authors.

This examination led to the same conclusion as that of Mr. Jenyns, the common Bat of Ireland proving identical with that of England, and consequently with the *V. Pipistrellus* of the Continent.

Observations on the habits, &c. of this species, when at large and in captivity, were also given in detail, and were followed by some remarks on the Long-eared Bat (*Plecotus auritus*) as observed in Ireland.

The occurrence of the *Larus Sabini* in Ireland on two occasions was next adverted to. Of this bird two specimens only had previously been recorded as met with in the Eastern Hemisphere, both of which were obtained by Captain Sabine at Spitzbergen. The specimens which formed the subject of the present paper were rendered peculiarly interesting from being in the plumage of the first year, in which state the *Larus Sabini* had not before come under the inspection of the naturalist. The appearance presented by the species at this age was described with great minuteness, and also the differential characters by which it may at all ages be distinguished from its congener the *Larus minutus*.

The specimens described are contained in the Museums of the Natural History Society of Belfast and the Royal Society of Dublin.

From the examination of a specimen of the *Cygnus Bewickii*, killed in the North of Ireland, and preserved in the Belfast Museum, the author stated that he was led to discover that some of the characters by which this species has hitherto been distinguished are erroneous.

The principal character pointed out as such was the number of *rectrices* or tail-feathers, which are described in the Linn. Trans. (vol. xvi. p. 445, *et seq.*), Illust. of Orn. (part 6.), Illust. of Brit. Orn., &c., to be 18, though they are in reality 20. The correctness of the view

respecting this and the other characters thus dwelt upon was subsequently confirmed from an inspection of two living birds, which have been since Feb. 1830 in the possession of William Sinclair, Esq. of the Falls, near Belfast.

Observations on the dispositions, habits, &c. of these individuals were also added.

The Three-spined Stickleback of the North of Ireland was dwelt upon at considerable length, and the differential characters between it and the three English species, as described by Mr. Yarrell, (Mag. of Nat. Hist. vol. iii.) pointed out. From all of these it was stated to be distinct, but seemingly identical with the *Gasterosteus brachycentrus* of the *Hist. Nat. des Poissons* of Cuvier and Valenciennes (tom. iv. p. 499. pl. 98.), a species there published as new, and mentioned as having been obtained by M. Savigny from the brooks of Tuscany.

The discrepancy between Cuvier (*Règne Animal*, 2nd ed.) and British authors relative to the *Gasterosteus pungitius* of Linnæus, was next noticed.

It was remarked of the *Gobius niger*, from specimens taken in the North of Ireland, (on the shores of which country the species has not before been recorded as met with,) that the fish so named by Donovan, with which these were identical, is distinct from the *G. niger* of Pennant, and as such ranks as a third species of *Gobius* to the British Fauna, two species only having yet a place in it.

The *Cyclopterus Montagui* Don. which stands recorded as having been taken only on the southern coast of England, and there but by its discoverer, was next noticed, from the circumstance of a specimen occurring to the author on the coast of the County of Down in December 1833. The difference, consisting chiefly in colour and markings, between this fish (which was mature) and Colonel Montagu's as described in the Wern. Mem. (vol. i. p. 92.), was pointed out.

Specimens of all the species treated of in this paper, with the exception of *Cygnus Bewickii*, were exhibited.

Mr. Thompson at the same time laid before the Society a list containing upwards of thirty species of land and freshwater Shells, new to Ireland. It was stated that they had not appeared in any of the three published Catalogues of the Shells of that country, nor, so far as the author was aware, were they incidentally noticed elsewhere.

A new species of *Limneus*, discovered in the South of Ireland by William H. Harvey, Esq., was also described and characterized under the name of *L. involutus*.

June 3. Read a Letter addressed to the Under Secretary, by W. Thompson, Esq. of Belfast, giving an account of two specimens of *Sterna stolida*, which had been shot off the coast of Wexford.

Nov. 4. Read a Notice by William Thompson, Esq., of the minute fish *Lepadogaster bimaculatus*, Flem., having occurred to him in two localities, when dredging on the north-east coast of Ireland. The specimens, of which three were taken, were described in detail, and the characters pointed out in which they did not correspond with the published descriptions of the species; the most striking difference being the want of the two lateral spots, whence the species had derived its specific appellation.

1835.

Feb. 17. Read some account of the habits of the *Anolius bullaris* of Cuvier. By Mr. Robert H. Schomburgk. Communicated by the Secretary.

After a full description of the animal, which appears to be one of the most common of the West Indian lizards, and is already well known to naturalists, Mr. Schomburgk observes that the colours are so variable as to be with difficulty determined; the hue changing with every degree of inflation of the body, from greenish grey with pale longitudinal stripes, to a darkish brown or cinereous with irregular spots, and at times to a uniform bright green. These changes are most conspicuous and rapid when two males meet in combat, at which time also the dorsal and caudal crest rises to an unusual

height, and the throat-pouch is alternately distended and flattened, displaying its vivid colours. The attack is generally made by seizing each other by the jaw, and they retain the hold for a considerable time. They commonly live upon trees, but at times enter houses in search of flies and other insects, running with ease, like the rest of the genus, upon smooth perpendicular walls, or even on the ceilings and on glass. They are easily rendered sufficiently tame to eat from the hand. Their food consists principally, if not exclusively, of insects, and they seize and devour wasps with impunity. Even the scorpion is not able to defend itself effectually from their attack, as they generally seize the insect by the head, and the scorpion in its endeavour to sting its enemy more frequently wounds itself. When pursued on a plane surface the tail is often carried erect. They leap with surprising agility from branch to branch, often to a distance of twelve times their own length; but they are often caught by boys, who take advantage of their fondness for musical sounds, arresting their attention by whistling to them, and then throwing a little noose over the head. Mr. Schomburgk rarely found more than two eggs in the oviduct at one time, of which one was much less developed than the other. They drop their eggs without any precaution, which are found in various places, on the sand, on rocks, in rooms, &c.

Feb. 17. Read also a Letter addressed to the President from Mr. William Money, giving an account of a Goat in his possession producing five kids at a birth.

Nov. 3. Mr. Lambert, V.P. exhibited specimens of an arborescent species of Dahlia from Oaxaca.

Nov. 17. Read a Notice by Mr. Adam White of a male *Picus martius*, L., having been shot in 1834 at Billingford, Norfolk. Another individual was seen at the same time.

Dec. 1. A Portrait of Robert Brown, Esq. V.P., by Mr. Pickersgill, R.A., was presented to the Society by Mr. Bentham, in the name of the following Subscribers:

His Grace the Duke of Somerset.
J. E. Bicheno, Esq.
George Bentham, Esq.
A. B. Lambert, Esq.
Archibald Menzies, Esq.
William Christy, jun., Esq.
Richard Taylor, Esq.
Edward Forster, Esq.
W. G. Maton, M.D.
Francis Boott, M.D.
Thomas Bell, Esq.
W. H. Lloyd, Esq.
N. B. Ward, Esq.
G. B. Greenough, Esq.
C. G. B. Daubeny, M.D.
W. H. Fitton, M.D.
E. T. Bennett, Esq.
J. J. Bennett, Esq.
Richard Latham, Esq.
J. E. Bowman, Esq.
The Rev. Edward Stanley, M.A.
William Yarrell, Esq.
J. F. Royle, Esq.
R. H. Solly, Esq.
Allan Cunningham, Esq.
David Don, Esq.
Hugh Cuming, Esq.
John Curtis, Esq.
William Spence, Esq.
J. C. Cox, Esq.
John Martin, Esq.
T. B. Salter, Esq.
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Dr. Franck.
John Smirnove, Esq.
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R. I. Murchison, Esq.
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W. J. Hooker, LL.D.
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Sir John Franklin, C.B., Capt. R.N.
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The Rev. F. W. Hope, M.A.
John Alexander Hankey, Esq.
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John Bostock, M.D.
Eagle Henderson, Esq.
Alexander Henderson, Esq.
Alexander MacLeay, Esq.
Mr. William Anderson.

1836.

Jan. 19. Mr. Yarrell, for Mr. Heysham of Carlisle, exhibited the egg, the young bird a week old, one three weeks old, and the adult female of the *Charadrius Morinellus*, L., obtained on Skiddaw in the summer of 1835. Several pairs were seen breeding in the same locality.

March 1. Read some Account, by Lieut-Colonel Sykes, F.R.S. F.L.S., &c., of a species of *Agave*, introduced accidentally into the Deccan.

A number of young plants of this species came up accidentally in the garden of the collector at Poonah, in a border that had been appropriated the year before to a collection of bulbous roots that

had been obtained from the Cape of Good Hope. One of the plants flowered in the fifth year after their first appearance. The height of the flower-stem was twenty-five feet. Although the flowers were apparently perfect, no seeds were produced. After the flowers had fallen, a multitude of small bulbs were produced on the branches. In another plant, which subsequently flowered, the stem attained the height of forty-four feet, with a circumference of two feet ten inches near the base. Those of the other plants varied from twenty-four to twenty-nine feet.

The species proves to be identical with the *Agave cubensis*, a plant discovered by Jacquin in the island of Cuba. It belongs to Ventenat's *Fourcroya*, a group of species distinguished from the normal *Agaves* by their dilated filaments, and by the thickened base of the style.

A period of from five to seven years elapses before the plants produce their flower-stems.

The disposition to produce bulbs in the species of this genus appears to be influenced a good deal by the nature of the soil and climate.

Mr. Royle has remarked of *Agave vivipara* in India, that in rich soils the plant invariably produced bulbs but no seeds, while a poor soil and dry climate had the contrary effect. These bulbs retain their vitality for a very long time and under almost any circumstances, so that the plants are easily transported from one country to another; which circumstance, together with the facility with which they multiply and become naturalized, renders it often difficult to trace the species to their original localities. Several bulbs of *Agave cubensis*, which had been nearly two years in Colonel Sykes's Herbarium, grew on being planted in the earth.

June 7. A Portrait of Edward Forster, Esq. V.P. and Treasurer of the Society, by Mr. Eddis, was presented by the following Fellows:

Richard Taylor, Esq., Under-Sec. L.S.
Francis Boott, M.D. Sec. L.S.
N. B. Ward, Esq.
William Borrer, Esq.
George Bentham, Esq.
A. B. Lambert, Esq. V.P.L.S.

John A. Hankey, Esq.
R. H. Solly, Esq.
J. E. Bicheno, Esq.
John Bostock, M.D.
Rev. Thomas Rackett, M.A.
Robert Brown, Esq. V.P.L.S.
Sir W. J. Hooker.
John Guillemard, Esq.
Davies Gilbert, Esq.
The Earl of Derby.
Thomas Bell, Esq.
Joseph Sabine, Esq.
L. W. Dillwyn, Esq. M.P.
William Christy, Jun. Esq.
William Harrison, Esq.

Nov. 15. A Portrait of Archibald Menzies, F.L.S., by Mr. Eddis, was presented by the following Fellows:

N. B. Ward, Esq.
S. H. Haslam, Esq.
Francis Boott, M.D. Sec. L.S.
William Yarrell, Esq.
Richard Taylor, Esq. Under-Sec. L.S.
Edward Forster, Esq. V.P.L.S.
J. J. Bennett, Esq.
R. H. Solly, Esq.
E. J. Quekett, Esq.
William Christy, Jun. Esq.
Thomas Bell, Esq.
Robert Brown, Esq. V.P.L.S.
Sir W. J. Hooker.
Joseph Hooker, Esq.
T. B. Salter, M.D.
Dawson Turner, Esq.
Charles Stokes, Esq.

Nov. 15. The Secretary read a Letter from Mr. Nicholson, giving an account of a young bird, just fledged, of the Hawfinch (*Coccothraustes europæa*) having been picked up from off the ground in a wood at Lullingstone Castle, Kent, in the month of June last. The noise which it made on being taken up soon brought the parent birds to the spot, so that their nest must have been at no great distance, as the young bird was unable to fly. Mr. Doubleday has remarked that the bird frequently breeds in Epping Forest; and it is perhaps owing to its shy habits that the fact of its continuing throughout the year and breeding in this country escaped the notice of Latham and Montagu.

1837.
Feb. 7. Mr. George Luxford, A.L.S. exhibited specimens of *Polygonum dumetorum* and *Epipactis purpurata* collected by him near Reigate, Surrey.

Feb. 7. Read a Description of a new British Grass, by Charles C. Babington, Esq., M.A. F.L.S.

Festuca (*Sclerochloa*) *Borreri,* paniculâ divaricatâ : ramis fructiferis adscendentibus patentibus, spiculis linearibus sub- 4-floris, flosculis liberis, glumis apiculatis obsoletè 5-nerviis, radice fibrosâ.

Differt a *F. distante* (*Glyceria*, Sm.) paniculæ ramis fructiferis adscendentibus, spiculis sub- 4-floris et glumâ corollinâ apiculatâ cum nervo dorsali ad apicem producto ; a *F. procumbente* paniculæ ramis patentibus, spiculis dimidio minoribus, glumâ corollinâ apiculatâ et caule erecto ; a *F. maritima* (*F. thalassina*, Kunth) paniculæ ramis fructiferis patentibus, spiculis dimidio minoribus, foliis planis.

I have named this plant in compliment to my friend William Borrer, Esq., by whom it has long been considered as a distinct species. It appears to be far from rare upon the sea-coast, but has been usually confounded with *Glyceria distans* of Sir J. E. Smith. I have gathered it at Harwich and in Canvey Island, Essex ; and Mr. Borrer informs me that he has observed it in various places on the coasts of Hampshire and Sussex.

Feb. 21. Mr. Iliff, F.L.S. exhibited a piece of an Oak, which was blown down in Windsor Park during the late storm, and which, on being split open, was found to contain the following letters and figures cut in the wood, and the impressions reversed on the layers subsequently formed, "*W. B.* 1670."

XXXV. *Extracts from the* COUNCIL MINUTE-BOOK *of the* LINNEAN SOCIETY *of* LONDON.

1832.

June 23. THE President laid before the Council a letter addressed to his Lordship by the Chairman and Deputy Chairman of the Honourable Court of Directors of the East India Company, as follows:

"My Lord, "East India House, June 19th, 1832.

"The Court of Directors of the East India Company have within the last two years caused to be distributed to various bodies in this country and in Europe, interested in the promotion of science, between seven and eight thousand species of plants, collected by celebrated naturalists in the Company's service during a series of years in India.

"The object being attained for which the originals of these specimens have been placed with Dr. Wallich in Frith-street, the Court of Directors feel that this collection may not be an unacceptable addition to the Museum of the Linnean Society of London, which already possesses the Herbarium of the celebrated Linnæus. We have therefore the honour, at the instance of the Court of Directors, and in the name of the East India Company, to proffer through your Lordship for the acceptance of the Linnean Society, the Collection in question; and should the Council of the Society be pleased to give effect to the intentions of the Court, the necessary directions will be given to Dr. Wallich to transfer the Collection to the party who may be authorized by the Council to receive the same.

"We have the honour to be,
"My Lord,
"Your Lordship's most obedient humble Servants,

(Signed) "JOHN G. RAVENSHAW,
"C. MAJORIBANKS."

"The Lord Stanley, M.P.
"&c. &c. &c."

The Council proceeded to take the above letter into consideration, and voted the following Address to be presented to the Court of Directors on Tuesday next, the 26th instant, by a Deputation of the Council, viz.

"The Council of the Linnean Society having had a letter laid before them by the President, addressed to His Lordship by the Chairman and Deputy Chairman of the Court of Directors of the East India Company, in which that Honourable Court have been pleased to offer for the acceptance of the Society the extensive collection of dried plants preserved in the Museum of the India House, take the earliest opportunity of expressing their high sense of the distinguished honour conferred upon the Society by this unexampled act of liberality.

"The Council, in behalf of the Society, accept with feelings of profound gratitude the Collection thus proffered to them, and beg to assure the Court that it shall be held as a trust for the general benefit of science.

"The Council cannot avoid expressing their admiration of the enlightened policy shown by the Honourable Court of Directors with relation to their collections in natural history, in extending the advantage to be derived from them by the most liberal distribution of specimens throughout the scientific world, and by this memorable instance of their munificence in placing the fruits of the labours of König, Roxburgh, Röttler, Russell, Klein, Hamilton, Heyne, Wight, Finlayson, and Wallich with those of the immortal Linnæus.

"The East India Company, by extending its patronage to those distinguished naturalists who have cultivated science in Asia, so much to their own honour, and to the credit of the service to which they belonged, and by the generous use of the rich materials in its possession, has deeply impressed the members of every learned institution throughout Europe and America with feelings of admiration and respect; and the Council of the Linnean Society can only reecho the voice of general acknowledgement for the great services which the Honourable Company has thus rendered to the cause of science.

"An example of disinterestedness has been exhibited by the Company which has already reflected, and will continue to reflect deserved honour upon them and upon the country, and which cannot fail to diffuse a spirit of emulation throughout the world."

June 26. The Address voted at the last Meeting to the Court of Directors of the Honourable East India Company, which had been engrossed on vellum, was signed by the President and the other members of Council present, and the seal of the Society was then affixed to it.

August 7. The Secretary reported that on June 26th the President, Mr. Brown, Mr. Forster, General Hardwicke, Dr. Nicholl, Mr. Bentham, Mr. Solly and himself waited on the Chairman and Deputy Chairman of the Court of Directors of the East India Company with the Address voted on the 23rd.

1836.

Nov. 1. The Secretary reported that he had received a letter from Dr. Horsfield, dated September 27th, in which it was stated, that in obedience to an order of the Court of Directors of the East India Company, he had sent to the Society Dr. Wallich's collection of plants and fruits in spirits in 172 bottles, and Mr. Royle's herbarium in 130 bundles; the plants of Mr. Royle to be distributed by the Society in the name of the East India Company as the plants of Dr. Wallich were distributed.

CATALOGUE

OF THE

LIBRARY OF THE LINNEAN SOCIETY.

Continued from page 786 of Vol. XVI. of the Society's Transactions.

N.B. To Books which are Continuations of Works included in any of the former Parts of the Catalogue, the original Numbers are here affixed; and the other Books are numbered in regular progression.

1635. Arnold's Library of the Fine Arts, no. 6. London, 1833, 8vo.
1636. Babington's (C. C.) Flora Bathoniensis. Bath, 1834, 8vo.
1364. Banks's (G.) Plymouth and Devonport Flora, no. 8. Devonport, 1832, 8vo.
1637. Batka's (J. B.) Lauri Malabathri Lamarckii adumbratio. (*Ex Act. Acad. Cæs. Nat. Cur. tom.* 17.) 4to.
1638. ———— Ueber Sarsaparill. Leipzig, 1834, 8vo.
1639. Bauer's (F.) Delineations of Exotick Plants, cultivated in the Royal Gardens at Kew, nos. 1, 2, and 3, fol.
1640. Baxter's (W.) Figures of British Flowering Plants found in Oxfordshire and its contiguous Counties, no. 1—53. Oxford, 1834—36, 8vo.
1641. Beck's (L. C.) Botany of the Northern and Middle States of N. America. Albany, 1833, 8vo.
1642. Beke's (C. T.) Views in Ethnography, the Classification of Languages, the Progress of Civilization, and the Natural History of Man. (*From the Edinb. New Phil. Journ.*) 8vo.
1643. Bell's (T.) Monograph of the Testudinata, parts 1—8. London, 1832—3, fol.
1644. Bentham's (G.) Labiatarum Genera et Species. London, 1832—4, 8vo.
1645. ———— Scrophularineæ Indicæ. London, 1835, 8vo.
1646. Berkeley's (M. J.) Gleanings of British Algæ, being an Appendix to the Supplement to English Botany. London, 1833, 8vo.
1647. Bertolonii (A.) Flora Italica, vol. 1, and fasc. 1 and 2 of vol. 2. Bononiæ, 1833—5, 8vo.
1648. ———— Mantissa Plantarum Floræ Alpium Apuanarum. Bononiæ, 1832, 4to.

1649. Billberg (G. J.) Aminnelse-Tal öfver Herr Dr. Carl P. Thunberg. Stockholm, 1832, 8vo.

1650. Blackwall's (J.) Researches in Zoology. London, 1834, 8vo.

1651. Blume (C. L.) De novis quibusdam Plantarum Familiis expositio, et olim jam expositarum enumeratio. 8vo.

1652. ———— Eenige Waarnemingen om Trent den Culilawan-boom van Rumphius. 8vo.

1653. Boisduval (J. A.) Europæorum Lepidopterorum Index Methodicus, pars 1. Parisiis, 1829, 8vo.

1380. Bonaparte (C. L.) Osservazioni sulla seconda edizione del Regno Animale del Barone Cuvier. Bologna, 1830, 8vo.

1381. ———— Saggio di una Distribuzione Metodica degli Animali Vertebrati. Roma, 1831, 8vo.

1654. ———— Saggio di una Distribuzione Metodica degli Animali Vertebrati a Sangue Freddo. Roma, 1832, 8vo.

1655. ———— Supplemento allo Specchio Comparativo delle Ornitologie di Roma e Filadelfia. Pisa, 1832, 8vo.

1656. Brayley (E. W.) jun. On the Distribution of the powers of producing Heat and Light among the different groups of the Animal Kingdom. London, 1835, 8vo.

1657. Brez (J.) La Flore des Insectophiles. Utrecht, 1791, 8vo.

1658. Broderip's (W. J.) Hints for collecting Animals and their Products. London, 1832, 8vo.

1389. Brongniart (Ad.) Histoire des Végétaux Fossiles, livr. 7—9. Paris, 1832—4, 4to.

1659. Brougham's (Lord) Address to the Members of the Manchester Mechanics' Institution on the 21st of July, 1835, with a Report of the Proceedings of the General Meeting then held.

1393. Brown (R.) Vermischte botanische Schriften von C. G. Nees von Esenbeck. 5te band. Nürnberg, 1834, 8vo.

1660. Burchell's (W. J.) List of Quadrupeds brought by Mr. Burchell from Southern Africa, and presented by him to the British Museum, Sept. 30th, 1817. 8vo.

1661. Burmeister's (H.) Manual of Entomology, by W. E. Shuckard. London, 1836, 8vo.

1662. Burnett's (G. T.) Lecture delivered in King's College, London. London, 1832, 8vo.

1663. ———— Inaugural Address at a Meeting of the Medico-Botanical Society of London. London, 1833, 8vo.

1664. ———— Outlines of Botany, 2 vols. London, 1835, 8vo.

1665. ———— Lecture delivered in Chelsea Garden. London, 1835, 8vo.

1666. Chevrolat (A.) Coleoptères du Mexique, fasc. 1 & 2. Strasburg, 1834, 8vo.

1667. Children's (J. G.) Address delivered at the Anniversary of the Entomological Society, January 26th, 1835.

1668. Clark's (B.) Stereoplea; or the Defence of the Horse's Hoof considered. London, 1832, 4to.

1669. ——— The Cholera unmasked; or, its Name, Nature, and Causes pointed out. London, 1833, 4to.

1670. ——— Treatise on the Bits of Horses. London, 1834, 4to.

1153. Colla (A.) Illustrationes et Icones rariorum Stirpium quæ in ejus Horto Ripulis florebant, annis 1827—28, addita ad Hortum Ripulensem append. 4. (*From Mem. Acad. R. di Torino, tom. 35.*) 4to.

1671. ——— Plantæ rariores in regionibus Chilensibus a M. D. Bertero nuper detectæ. (*From Mem. Acad. R. di Torino, tom. 37.*) 4to.

1672. ——— Elogio Storico dell' Accademico Professore Giov. Batt. Balbis. Torino, 1832, 4to.

1673. ——— Herbarium Pedemontanum, juxta Methodum Naturalem dispositum, vol. 1. Augustæ Taurinorum, 1833, 8vo.

1674. Cooper (D.) Flora Metropolitana. London, 1836, 12mo.

1675. Cooper's (T. H.) Botany of the County of Sussex. Lewes, 1834, 8vo.

1676. Costa (O. G.) Catalogo dei Lepidotteri del Regno di Napoli. (*Estr. dal Diz. Univ. di Agricolt.*) 8vo.

1677. Couch's (J.) Treatise on the Natural History of the Pilchard, with particular reference to the Fisheries of Cornwall. (*From the Third Report of the Royal Cornwall Polytechnic Society.*) 8vo.

1038. Curtis's (J.) British Entomology, no. 101—156. London, 1832—36, 8vo.

1158. Curtis's (W.) Botanical Magazine, 1st series, vol. 1—42. London, 1793—1815, 8vo.

——— 2nd series, conducted by Dr. Sims, vols. 43—53. London, 1816—26, 8vo.

——— 3rd series, by Dr. Hooker, vol. 6—10. London, 1832—36, 8vo.

1163. Cuvier (G.) et St. Hilaire (G.) Histoire Naturelle des Mammifères, livr. 66 & 67. Paris, 1833, fol.

1407. Cuvier (G.) et Valenciennes (A.) Histoire Naturelle des Poissons, tom. 9, 10, & 11. Paris, 1833—6, 8vo.

Dahlbom (A. G.) Dissertationes Academicæ. Londini Gothorum, 8vo.

1678. ——— Monographia Pompiliorum Sueciæ, præside C. F. Fallen. 1829.

1679. ——— Exercitationes Hymenopterologicæ ad illustrandam Faunam Suecicam, pars 1—6. 1831—33.

1680. ——— Bombi Scandinaviæ. Resp. P. W. Brandsten. 1832.

1681. ——— Clavis novi Hymenopterorum Systematis, adjecta synopsi larvarum ejusdem ordinis Scandinavicarum Eruciformium. Lundæ, 1835, 4to.

1682. Daubeny's (C.) Inaugural Lecture on the Study of Botany. Oxford, 1834, 8vo.

1683. ——— Specimen of a proposed Index to the Oxfordshire Flora. 8vo.

1684. Daubeny's (C.) Narrative of an Excursion to the Lake Amsanctus and to Mount Vultur in Apulia, in 1834. Oxford, 1835, 8vo.

1166. Decandolle (A. P.) Prodromus Systematis Naturalis Regni Vegetabilis, pars 3—4. Parisiis, 1828—30, 8vo.

1685. ——————Botanicon Gallicum, seu Synopsis Plantarum in Flora Gallica descriptarum. ed. 2da a J. E. Duby digestum. Paris, 1828—30, 8vo.

1686. —————— Notice sur les progrès de la Botanique pendant l'année 1832. (*Bibl. Univers. Jan.* 1833.) Genève, 1833, 8vo.

1687. Decandolle (A. P. & Alph.) Notice 5, 6, et 7, sur les Plantes rares cultivées dans le Jardin de Genève. 4to. (*From Mem. de la Soc. de Genève.*)

1688. Decandolle (Alph.) Distribution Géographique des Plantes alimentaires. (*Tiré de la Bibl. Univ. de Genève.*) Genève, 1836, 8vo.

1689. De la Beche's (H. T.) Geological Manual, 3rd edition. London, 1833, 8vo.

1690. De Lolme (J. L.) The Constitution of England, a new edition, by W. H. Hughes. London, 1834, 8vo.

1691. Desjardins (J.) 6ème Rapport annuel sur les Travaux de la Société d'Histoire Naturelle de l'Ile Maurice. Port Louis, 1835, 4to.

1692. Dewhurst's (H. W.) Dissertation on the Component Parts of an Animal Body. London, 1831, 12mo.

1693. —————— Synoptical Table of an improved Nomenclature for the Sutures of the Cranium. London, 1830, 12mo.

1694. —————— Essay on the Study of Natural History. London, 1831, 12mo.

1695. —————— Observations on the probable causes of Rabies in Dogs. London, 1831, 12mo.

1696. —————— Practical Remarks on the Inutility of the Hydrostatic Test in the detection of Infanticide. London, 1831, 8vo.

1697. —————— A Lecture illustrative of the Architecture of the Human Body. London, 1832, 12mo.

1698. —————— Practical Observations on the New System of Warming Dwelling-houses, &c. with hot water. London, 1832, 12mo.

1699. Dierbach (J. H.) Repertorium Botanicum. Lemgo, 1831, 8vo.

1700. Dolby's (Th.) and Roscoe's (Th.) Literary Cyclopædia, part 1. London, 1834, 8vo.

1701. Don (D.) On the Characters and Affinities of certain Genera of Plants, chiefly belonging to the Flora Peruviana. (*From Edinb. New Phil. Journ., Oct.,* 1832.) 8vo.

1702. ——— Attempt at a New Arrangement of the Ericaceæ. (*Edinb. New Phil. Journ.* 1834.) 8vo.

1422. Don's (G.) General System of Gardening and Botany, vol. 2 and 3. London, 1832—34, 4to.

1703. Donovan (E.) On Cholera Morbus. London, 1832, 8vo.

1704. Doubleday (H.) A Nomenclature of British Birds, being a Systematic Catalogue

of all the Species hitherto discovered in Great Britain and Ireland. London, 1836, 8vo.

1705. Dumortier (B. C.) Sylloge Jungermannidearum Europæ indigenarum, earum Genera et Species systematice complectens. Tornaci Nerviorum, 1831, 8vo.

1706. ——————— Recherches sur la structure comparée et le develloppement des Animaux et des Vegetaux. Bruxelles, 1832, 4to.

1707. ——————— Notice sur le genre Maclenia, de la famille des Orchidées. Bruxelles, 1834, 4to.

1708. ——————— Essai Carpographique, présentant une nouvelle Classification des Fruits. Bruxelles, 1835, 4to.

1181. Edwards's (S.) Botanical Register, vols. 19—22, *new Series*, continued by Dr. Lindley. London, 1833—36, 8vo.

1709. Edwards (H. Milne) & M. Colin Mémoire de Physiologie Agricole sur la Végetation des Céréales. Versailles, 1835, 8vo.

1710. Ehrenberg (C. G.) Zur Erkentniss der Organization in der Richtung des kleinsten Raumes. 2ter beitrag, fol. Berlin, 1832.

1711. ——————— Naturreich des Menschen, oder das Reich der willensfreien beseelten Naturkörper, in 29 Classen geordnet. Berlin, 1835. Single sheet.

1712. Eichwald (E.) Zoologia Specialis, voll. 3. Vilnæ, 1829—31, 8vo.

1713. Embleton's (R.) Address delivered at the Fourth Anniversary of the Berwickshire Naturalists' Club, Sept. 16, 1835. 8vo.

1714. Endlicher (St.) Flora Posoniensis. Posonii, 1830, 8vo.

1715. Eyton's (T. C.) History of the Rarer Species of British Birds. London, 1836, 8vo.

1716. Faldermann (T.) Coleopterorum ab illustr. Bungio in China Boreali, Mongolia, et Montibus Altaicis collectorum, nec non ab illustr. Turczaminoffio et Stschukino e Provincia Irkutsk missorum illustrationes. Petropoli, 1835, 4to.

1187. Ferrusac (J. D. de) Bulletin des Sciences Naturelles et de Geologie, tom. 27. Paris, 1831, 8vo.

1717. ——————— Note sur deux genres de Cephalopodes, *Calmaret* et *Cranchie*, et sur une nouvelle espèce de chacun de ces deux genres. (*Extr. du Magazin de Zoologie, partie* 1.) 8vo.

1718. Fischer (F. E. L.) et Meyer (C. A.) Index seminum, quæ Hortus Botanicus Imperialis Petropolitanus pro mutua commutatione offert. Accedunt Animadversiones Botanicæ nonnullæ. 1835, 8vo.

1719. ——————— Lettre sur le genre Xeranthemum, avec 2 planches. 4to.

1720. Fischer de Waldheim (Gotth.) Notice sur le Phlocerus, genre nouveau d'Orthoptères de la Russie. Moscou, 1833, 8vo.

1721. ——————— Bibliotheca Palæonthologica Animalium systematica, ed. alt. Mosquæ, 1834, 8vo.

1722. Fitton's (W. H.) Notes on the progress of Geology in England. (*From Phil. Mag.* 1833.) 8vo.

1723. ———— Geological Sketch of the Vicinity of Hastings. London, 1833, 12mo.

1724. Forster's (T.) Facts and Inquiries respecting the Source of Epidemia, third edition. London, 1832, 8vo.

1725. ———— Observations sur l'Influence des Comètes sur les phénomènes de l'Atmosphère. Aix-la-Chapelle, 1836, 8vo.

1726. Francis's (G.) Catalogue of British Flowering Plants and Ferns, published in Dr. Hooker's British Flora. Single sheet, 1835.

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The Binder is requested to observe, that as a general Title-page and a Table of Contents for the whole Volume are now given, the Title-pages and Tables of Contents to the separate Parts are to be cancelled.

ERRATA.

Page 375, line 5, *pro* insertâ, *lege* incertâ
376, — 5, *pro* indicunt, *lege* induunt
378, — 1, *pro* miracidæ, *lege* mirandæ
— — 6, *dele* latis
— — 22, *pro* linearibus, *lege* lineares
380, — 1, *pro* in fertilibus, *lege* infertilibus
381, — 30, *pro* latis, *lege* satis
383, — 9, *pro* spiralis, *lege* spirales
384, — 4, *pro* totis, *lege* unde
— — 15, *pro* appressa, *lege* appressæ
385, — 33, *pro* futura, *lege* fœtura
386, — 11, *pro* sortila, *lege* sortita
387, — 14, *pro* superficies, *lege* superficie
393, — 26, *pro* parietes, *lege* parietis

END OF THE SEVENTEENTH VOLUME.

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